Letter 03-56

November 3, 2003

Diane R. Nielson
Executive Director
Department of Environmental Quality
168 No. 1950 W.
Salt Lake City, Utah 84116

Re: JVWCD/Kennecott Utah Copper Corp. Ground Water Proposal

Dear Diane:

It was a pleasure to meet you at the Division of Water Quality and Friends of the Great Salt Lake meetings. As president of the Lake Front Gun, Fur and Reclamation Club I represent 58 club members. As you know, the members have serious concerns regarding the proposal for contaminants from the polluted aquifers to be placed into the Jordan River at 2100 South due to Kennecott mining operations.

56-1 After we became aware of this proposal we attempted to become more knowledgeable as to how these decisions are approved at various government levels. The Lake Front board of directors was able to submit a formal letter of protest within the original deadline. Also, our members have attended recent meetings to voice their concerns. We are not satisfied with the current proposal as outlined.

56-2 I do not consider myself an "environmentalist" or a "tree hugger". I do consider myself and the Lakefront members as "conservationists'. While we manage the Lake Front property in the pursuit of waterfowling (90 day season), we spend countless hours assisting wildlife in nesting, habitat and re-seeding projects the entire year. According to Dwayne from the Audubon Society, the Great Salt Lake wetland is, and will continue to be, of a global importance. I have personally spent 33+ years managing, hunting, fishing, trapping and recreating on this special fresh water ecosystem. The members of the Lake Front club care deeply about what could negatively impact both private and public lands surrounding the Great Salt Lake should these permits be approved.

There is no arguing that the Utah Lake/Jordan River system is somewhat polluted. I think that we would all agree that ignorance and years of abuse have played a great role in the status of this system today. I would hope that similar short-sightedness does not lead us down a similar path regarding the Great Salt Lake and surrounding wetlands. The addition of 146lbs of selenium and 22,000 tons of TDS (total dissolved solids) annually could be detrimental to a fragile ecosystem that is already taxed with high amounts of pollutants.

Comments to Letter 03-56

56-1 See the Response to Common Comment No. 8, indicating that the plan has been revised to eliminated any discharge to the Jordan River.

56-2 The comment period was extended, as indicated in the Response to Common Comment No. 1

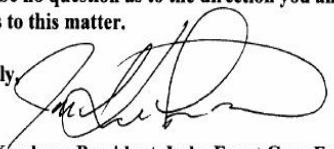
Letter 03-56 (cont)

I personally understand the mathematical model that was implemented by the public employees to authorize the permits. But, common sense and three decades of experience makes me question this proposal. The public and private wetlands surrounding the Great Salt Lake are impounded deltas with no clear, large flowing system with which to flush the proposed contaminants. There will, undoubtedly, be a build up of contaminants in the wetlands complex. Even if the contaminants were able to reach the Great Salt Lake as the terminal end point, how will this impact the lake and surrounding wetlands? What about being in the fifth year of a drought? What if the floods should return? The Lake Front club had over four feet of water in our clubhouse during the floods of the 80's. What will the level of contaminants do to the wells of private individuals, as well as to the game that hunters and families consume? There are simply too many "what ifs?" to allow the permits, based on a mathematical model, that state the numbers are within the law. We do

56-3 not accept Kennecott's assurances regarding their wetland project. Their track record of previously polluting is the issue at hand. The Lake Front members do not argue the point that these systems need to cleaned, and that it would benefit the public to do so. Don Ostler, P.E., responded to our concerns mentioned in our formal protest with the following quote. "We feel that the immediate benefits of an additional supply of high quality drinking water to the Salt Lake valley would seem to outweigh the potential risks of bio-accumulations of which we do not have representative data to demonstrate at this time." Don's answer is not acceptable to our club members. If the State does not have the data for potential risks, then we would urge the State to evaluate exactly what those risks would be. The Lake Front members would be more than willing to participate in a study conducted by an uninvolved third party to determine accurately these potential risks.

56-4 Both of the polluted aquifers were contaminated in the name of profit for Kennecott and their parent companies. We feel that both the A and B plumes should be handled in-house with the contaminants taken care of in a safe and appropriate manner. The public and private down stream users did not reap any profit from the Kennecott contamination. The Lake Front members fail to see why public and private landowners should now bear the responsibility of dealing with Kennecott contaminants and the consequences. I would hate to think that these permits would be pushed through in the name of profit at the expense of the State's precious wetlands. While many view the wetlands flying in and out of the airport, I would venture to guess that few are aware of their beauty and critical importance. There should be no question as to the direction you and the State of Utah should take in regards to this matter.

Sincerely,



Jason Kershaw, President, Lake Front Gun, Fur & Reclamation Club

Comments to Letter 03-56 (cont)

56-3 See the Response to Common Comment No. 9 regarding the additional studies which will be conducted on water quality of the Great Salt Lake in order to benefit the ecosystem, including waterfowl.

56-4 As indicated in the Revised Proposal and discussed in the Response to Common Comment Nos. 6 and 7, JVWCD has defined options for sending the waste concentrates to the tailings impoundment, and specific conditions which must be met before any discharge to the Great Salt Lake can be considered.

Letter 03-57

LEROY W. HOOTON, JR.
DIRECTOR

SALT LAKE CITY CORPORATION
DEPARTMENT OF PUBLIC UTILITIES
WATER SUPPLY AND WATERWORKS
WATER RECLAMATION AND STORMWATER

ROSS C. "ROCKY" ANDERSON
MAYOR

November 5, 2003

Utah Department of Environmental Quality
NRD Trustee
P.O. Box 144810
Salt Lake City, UT 84114-4810

Dear Trustee:

Salt Lake City Public Utilities (SLC) provides the following comments in response to the Southwest Jordan Valley Ground Water Cleanup Project Summary (Summary):

57-1 SLC supports the extraction and treatment of the contaminated groundwater underlying Southwest Jordan Valley to provide municipal-quality drinking water to the public, so long as it is done in an environmentally-protective manner. Generally, SLC applauds the efforts of Kennecott and the Jordan Valley Water Conservancy District (JVWCD) to find feasible ways to meet this goal. SLC does, however, have several concerns with the current plan described in the Summary, particularly regarding the waste streams from the

57-2 Zone B/Lost Use reverse osmosis (RO) plant, which is proposed to be built at approximately 8300 South 1000 West.

It is our understanding that both RO plants will produce a significant flow of treatment process concentrates. The Summary explains that treatment concentrates from the Zone A RO Plant will "be delivered via the Kennecott Tailings Pipeline to the Magna Tailings Impoundment" or, after mine closure, via a discharge line directly to the Great Salt Lake. The Summary further explains that "KUCC is willing to accept the concentrate stream of Zone B deep groundwater in its tailings slurry pipeline." Nonetheless, "JVWCD proposes, as the primary approach for the Project, to discharge the concentrate streams resulting from the Lost Use component (shallow wells) and from the Zone B deep wells northward to the Jordan River. The concentrate is proposed to discharge to the Jordan River at 2900 South, downstream from the Central Valley Water Reclamation Facility (CVWRF) discharge location."

57-3 JVWCD has recently applied for a UPDES permit (#UT0025551) (the "Permit") to allow the discharge of up to 2 million gallons per day of the concentrated waste from its Zone B/Lost Use RO treatment plant to the Jordan River. Under the Permit, JVWCD will also be allowed to discharge an additional 17.2 million gallons a day of additional waters to the Jordan River. The Summary and the Permit are not entirely clear as to what comprises this 17.2 MGD discharge, and we are seeking clarification on this point. It is not possible to comment on this discharge without additional information.

1530 SOUTH WEST TEMPLE, SALT LAKE CITY, UTAH 84115
TELEPHONE: 801-483-6900 FAX: 801-483-6818

Comments to Letter 03-57

57-1 See the Response to Common Comment No. 3.

57-2 As noted in the Response to Common Comment No. 8, under the revised Proposal, there will be no discharge of reverse osmosis (RO) concentrates to the Jordan River. The revised Proposal identifies three options for discharge to the tailings impoundment or the Great Salt Lake, depending on additional studies of the Great Salt Lake. See also the Response to Common Comment No. 6.

57-3 JVWCD withdrew its UPDES permit, as described in the Response to Common Comment No. 8.

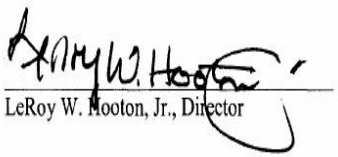
Letter 03-57 (cont)

57-4 SLC questions the wisdom of piping the concentrate from 8300 South to 2900 South simply to discharge the waste into the Jordan River. Management of the Zone B/Lost Use treatment concentrates in the same manner as the Zone A treatment concentrates seems to be a much more logical approach and is preferable for a variety of reasons. Discharge directly to the Jordan River may be improper under the antidegradation rules of federal Clean Water Act and the corresponding state program. SLC believes it would be much better for the health, safety and environment of Salt Lake County to pump the Zone B concentrate to the Kennecott Tailings Pipeline, as offered by Kennecott, or to alternative lined evaporative ponds.

57-5 Utah Administrative Code R317-2-3.1 provides in pertinent part that "Waters whose existing quality is better than the established standards for the designated uses will be maintained at high quality unless it is determined by the Board, after appropriate intergovernmental coordination and public participation in concert with the Utah continuing planning process, allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. However, existing instream water uses shall be maintained and protected. No water quality degradation is allowable which would interfere with or become injurious to existing instream water uses." As you are undoubtedly aware, the Utah Water Quality Rules have also recently been amended to require formal antidegradation review in many instances.

57-6 For these reasons, SLC encourages the Trustee to consider having JVWCD manage treatment concentrates from the Zone B/Lost Use RO plant in a like manner to those from the Zone A RO plant (*i.e.*, send to the Kennecott impoundment, provide other evaporative ponds or discharge directly to the Great Salt Lake). At the very least, the potential impact of these discharges on the river, its sediments and its environment should be evaluated.

Sincerely,



LeRoy W. Hooton, Jr., Director

cc: Don A. Osler
Chris Imbrogno
Richard Bay

Comments to Letter 03-57 (cont)

57-4 See the response to Common Comment No. 7.

57-5 Operations under the revised Proposal and implementing agreements will be regulated in accordance with water quality and drinking water regulations.

57-6 See above comments regarding management of RO concentrates.

Letter 03-58

C.F. (DERIC) HOPKINS

3601 EAST COVE POINT DR.
SALT LAKE CITY, UTAH 84109
801-580-4733

November 6, 2003

Utah Department of Environmental Quality
NRD Trustee
PO Box 144810
Salt Lake City, Utah 84114-4810

RE: Objection to the Jordan Valley Conservancy Discharge Permit

Dear Sir,

58-1 As a member of the Lakefront Gun, Fur, and Reclamation Club and a concerned citizen, I strongly object to the proposed permit allowing increased pollutants to be discharged into the Jordan River.

My concern is that the increased Pollutants will end up in the marshes and destroy the wetlands and aquatic life.

Sincerely,

Deric Hopkins

Comments to Letter 03-58

58-1 There is no discharge of reverse osmosis concentrates to the Jordan River under the revised Proposal. For additional information, see the Response to Common Comment No. 8.

Letter 03-59

1)

S.L. Duck Club
c/o Steve Gillmor
949 So. Lincoln St.
SLC UT 84105

Ms Diane R. Nielson
Executive Director
Dept of Environmental Quality
State of Utah.
168 No 1950 W
SLC 84116

Re: Jordan Valley Water Conservancy District / Kennecott Copper Corp. S.L. County Groundwater Contamination Cleanup

Dear Ms Nielson,

First of all my apologies for the quality of this coorespondance in terms of readability and possible spelling. My computer died this morning.

It has come to our attention that your agency is considering plans to clean groundwater contaminati.

Comments to Letter 03-59

Letter 03-59 (cont)

59-1 in the southern portion of S.L. county by dumping 2)

these concentrated salts and dangerous heavy metals directly into the Jordan River. Our obvious concern lies in the effect of these extremely toxic compounds in their meandering passage down the Jordan River and ultimately to the Great Salt Lake, its final resting place.

As we consider this passage of these proposed deadly agents, we must first consider the impact on the people who utilize this water for irrigation. This includes family farms which grow numerous small garden plots, hay and grain fields for cattle, sheep, or goats - which are all consumed by those citizens. Do we want these people ingesting high levels of these toxic compounds which may predispose them to numerous chronic diseases such as cancer or ms?

Also, the ecological effect on the river itself with all its plant & animal species in all its estuaries is enorm

Comments to Letter 03-59 (cont)

59-1 Under the revised Proposal, no reverse osmosis concentrates will be discharged to the Jordan River. Options for management of the concentrates will be considered after additional studies of the Great Salt Lake. For additional information, see the Responses to Common Comment Nos. 8 and 9.

Letter 03-59 (cont)

3

We have come a long way to clean up the Jordan River in the last 80 or so years. My father said as a boy he would fish for trout and swim in the river.

The river then became very polluted until more recently when efforts to clean it up are producing great results of a huge parkway system with beautiful trails, fishing for trout even and cleaner water.

I don't think we can afford to go backwards in our ecological efforts to make our world more inhabitable.

59-2 Lastly, the impact on the Great Salt Lake Ecosystem would be devastating in many ways ~~Environmentally, the brines~~

Economically, the brine shrimp industry would be severely impacted. Also destruction of brine shrimp has a direct impact on ~~the~~ waterfowl who use our wetlands as stopping grounds and nesting habitat.

Comments to Letter 03-59 (cont)

59-2 The work which will be conducted to set numeric standards for the Great Salt Lake will include evaluations of brine shrimp and waterfowl. See Response to Common Comment No. 9.

also; from the bird's perspective, the effects can be anticipated. Based on past effects from similar reckless dumping of wastes into the Salton Sea in California which directly caused the destruction (permanent) of the wetland.

Destruction of this vast wetland along the shore of the Great Salt Lake also has far reaching effects on us; the people of the Wasatch Front. These enormous wetlands serve as important filter system for non-toxic wastes that eventually are deposited into the Great Salt Lake and never leave.

We vehemently oppose this plan, demand answers, & suggest that your great clean-up efforts should completed in a safe way by piping the effulent directly to tailing pond

59-3

59-3 See the Response to Common Comment No. 7 regarding discharges to the tailings impoundment.

Letter 03-59 (cont)

On behalf of the SA Dark Club, our membership, and associates

Sincerely yours,

Stephen T. Gillmon

Comments to Letter 03-59 (cont)

Letter 03-60

Nov. 9, 2003

Ms. Dianne Nielson
Executive Director
Utah Department of Environmental Quality
P.O. Box 144810
Salt Lake City, UT 84114-4810

Dear Dianne

As a long-standing trustee of The Nature Conservancy, board member of the Utah Wetlands Foundation, and president of the Burnham Duck Club, I am writing to you today to express my extreme concern and opposition to the proposed plan by Kennecott Copper and the Jordan Valley Water Conservancy District to dump toxic waste into the Jordan River. While the clean-up of the Jordan valley aquifer is commendable, the proposed disposal of Zone B contaminants, including 22,000 tons of TDS and 150 lbs. of Selenium per year for 40 years, is simply not acceptable!

60-1

After attending the Oct. 28th public meeting at Sugarhouse Park Garden Center, it was unclear to me that any independent, objective studies had been conducted to evaluate the cumulative impact that these contaminants would have on the Jordan River system, the vast wetlands which it waters or, indeed, the Great Salt Lake itself. It appears as though the only studies were conducted in-house by KUCC and JVWCD and without much concern for the long-term impact of this proposal. I find it inconceivable that such a project would be undertaken with out an independent Environmental Impact Study or, at the very least, an Environmental Assessment having been done. It is also appears that precious little public input has been solicited. Having been in the works since 1995, it is evident that there was more than ample time for both.

60-2

The only thing that was clear after that Oct. 28th meeting was that KUCC and JVWCD were *unwilling* to accept the cost of proper disposal of this toxic waste which KUCC created in the first place and, instead, opted for the fastest, easiest and cheapest solution. " Filter the contaminants from the ground water and put them back into surface water." That makes a lot of sense!

Frankly, it is quite obvious that KUCC, JVWCD or both, under the current arrangement, stand to recoup millions of dollars in rebates from the ground water cleanup fund established in the 1990's. The more "cost effective" the disposal solution, the more money will be available to be refunded to KUCC and/or JVWCD at the end of the process. But, by embracing the cheapest possible solution, thousands of tons of contaminants will be flushed annually into the Great Salt Lake ecosystem for our children and grand children to cleanup sometime in the future. How much will that cost? Who will pay for it?

60-3

Comments to Letter 03-60

60-1 Jordan Valley Water Conservancy District has withdrawn its discharge permit and under the revised Proposal, there will be no discharge of reverse osmosis concentrates to the Jordan River. For further information, see the Response to Common Comment No.8.

60-2 While an EIS or EA is not required for the project, there has been independent review through the Technical Review Committee. In response to numerous stakeholders, the DEQ Division of Water Quality is also initiating studies to establish numeric water quality standards for the Great Salt Lake. See the Response to Common Comment No. 9.

60-3 See the Response to Common Comment Nos. 7, 8 and 9.

Letter 03-60 (cont)

I believe it is shortsighted for anyone to assume that dumping these amounts of TDS and especially Selenium into this system for 40 years could have anything but a disastrous effect on what is already a fragile ecosystem. I know from experience during the 1983 floods that accumulation of the salts alone will have a severely detrimental effect on wetlands vegetation, not to mention the effects of a 40 year buildup of Selenium, a semi heavy, toxic metal known to bioaccumulate and be harmful to not only wildlife but humans as well. One need only look to the 1980s disaster at Kesterson National Wildlife Refuge as an example of Selenium contamination.

The only *right* thing to do is to pipe the Zone B contaminates to the Magna Tailings Impoundment or ship them to an appropriate disposal facility where they will do no harm to our people or our environment. Unfortunately, all too often, doing the *right* thing is not the most "cost effective" solution.

The Great Salt Lake and its supporting wetlands represent a hemispherically important complex that is vital to millions of migratory shorebirds and waterfowl. It contributes, in no small way, to the annual snow pack along the Wasatch Front, eventually melting to recharge our streams, rivers and aquifers. It is a unique feature of this state and a legacy to its people. The Jordan River system, the Great Salt Lake and wetlands should not be regarded as an open sewer. What goes into the lake will, eventually, come out of the lake.

60-3 Please, Dianne, I ask that DEQ reconsider its position and revoke this discharge permit; at least until a more comprehensive, independent, long-term EIS is completed and other less damaging solutions are considered. Once something like this is done, it will be extremely difficult if not impossible to undo.

Sincerely,

David Quinney Jr.
President, Burnham Duck Club.

Cc.

- Don Ostler, Utah Division of Water Quality
- Olene Walker, Governor, State of Utah
- Michael O. Leavitt, Director, Environmental Protection Agency
- Jim Matheson, U.S. House of Representatives
- Ron Allen, Utah State Senate

Comments to Letter 03-60 (cont)

60-3 See above comments.

Letter 03-61

November 10, 2003

Dianne R. Nielson
Executive Director
Department of Environmental Quality
168 North 1950 West
SLC, Utah 84116

Re: Southwest Jordan Valley Ground Water Cleanup Project

Dear Dianne,

I am writing this letter in response to the proposed cleanup project associated with the two polluted sulfate plumes located in the south end of the valley. I have attended several public comment meetings and listened to the presentations by the representatives from Kennecott Utah Copper Corporation and the Jordan Valley Water Conservancy. After studying the information associated with the cleanup project, I am very concerned that the release of contaminants from Zone B into the Jordan River may have significant negative impacts on everyone who benefits from this critical and important water source.

61-1

I am a member of the Lakefront Duck Club and have been working and recreating in the wetlands for the past 30 years. My family has used these particular wetlands for five generations and we are always concerned with anything that could potentially harm this delicate ecosystem.

The main area of the cleanup project that I am concerned with is the potential for build-up of Selenium and other dissolved solids in the wetlands. The Jordan River **does not** flow directly to the Great Salt Lake. There is in intricate web of dikes and water control structures that massage the water in different directions depending on habitat needs, irrigation, reconstruction projects, nesting grounds, and the desires of the private land owners. In addition, the wetlands surrounding the Great Salt Lake are a critical staging area for thousands of migratory birds and a price tag cannot be placed on their importance. The water in the Jordan River is critical for the wetland survival; additional pollutants in the river can only threaten the existence of this valuable resource.

Dianne, I know you are in a difficult position and are being pressured by many different groups involved with this project. You have been asked to respond to many difficult questions at every meeting that I have attended, and I need to ask two additional questions:

1- **If you were a down-stream water user, would you want that water source to be polluted with heavy metals and sulfates?**
2- **Would you want to eat fish or other game animals that have been exposed to Selenium, sulfates, or other toxins?**

The honest and logical response is NO!

Comments to Letter 03-61

61-1 As indicated in the Response to Common Comment No. 8, reverse osmosis concentrates from the Zone B treatment facility will not be discharged to the Jordan River.

Letter 03-61 (cont)

At the Friends of the Great Salt Lake meeting, the general consensus was that the Great Salt Lake and the surrounding wetlands are unique and irreplaceable. An environmental impact study has not been performed by an independent source, and the individuals representing Kennecott, Jordan Valley Water Conservancy, and the State of Utah provided little reassurance regarding potential public safety issues and additional cleanup plans regarding the release of the proposed contaminants into the river.

Diane, the individuals who utilize the Jordan River did not cause the ground water contamination, Kennecott Utah Copper Corporation is solely responsible. Therefore, Kennecott should be required to **appropriately** rectify the situation and not dispose of the contaminants in the Jordan River and potentially cause an additional sulfate plume in the wetlands. As the Natural Resource Damage Trustee, I urge you to look at the facts associated with this complicated case and deny the permits that could negatively impact the Jordan River, environment, and wetlands **forever**.

Sincerely,

Adam B. Kershaw

Adam B. Kershaw

Comments to Letter 03-61 (cont)

Letter 03-62

Intermountain West Joint Venture
2369 West Orton Circle • Suite 50 • West Valley City, Utah 84119 • (801) 975-3330 ext. 129 • fax (801) 975-3331

November 10, 2003

Utah Department of Environmental Quality
Natural Resource Damage Trustee
P.O. Box 144810
Salt Lake City, UT 84114-4810

To Whom It May Concern:

We appreciate the opportunity to comment on the contaminant discharge associated with the proposed Southwest Jordan Valley Ground Water Cleanup Project. Obviously, the proposal to extract ground water and remove contaminants associated with the Kennecott Utah Copper Corporation mining activities and improve water quality in the underlying aquifer, is highly commendable.

62-1 But, we take serious issue with the proposed discharge of these contaminants (namely selenium and salts) into the Jordan River and subsequently the Great Salt Lake wetlands.

First let me explain the basis for our interest. The Intermountain West Joint Venture (IWJV) is a public-private partnership whose purpose is to advance avian and wetland habitat conservation within the bounds of the Joint Venture. We are part of a network of joint ventures across North America that was established by international agreement under the first Bush administration to accomplish the conservation goals of the North American Waterfowl Management Plan. The IWJV was established in 1994.

Within the IWJV, we have identified some 56 wetland focus areas across our 11-state area, which represent the "best of the best" in wetland habitat in this region. Without question, the Great Salt Lake wetlands focus area is our most significant in terms of its inherent value for diversity and numbers of avian species. In fact, the wetlands of the Great Salt Lake are internationally recognized for their importance to shorebirds and have been designated a Hemispheric Reserve (sites which host at least 500,000 shorebirds or 30 percent of the flyway population) by the Western Hemisphere Shorebird Reserve Network (WHSRN). Please let me acquaint you with a sample of these values:

Comments to Letter 03-62

62-1 As indicated in the Response to Common Comment No. 8, Jordan Valley Water Conservancy District has withdrawn its UPDES permit. Reverse osmosis concentrates will not be discharged to the Jordan River.

Letter 03-62 (cont)

- 110 million bird-days of use are recorded in Great Salt Lake habitats and more than 250 bird species congregate on or near the Lake each year.
- The marshes of the Great Salt Lake support more than 85,000 breeding pairs of ducks. In addition, some 300,000 northern pintail ducks migrate through these wetlands each year.
- Also, half of the continental population (70,000) of tundra swans use Great Salt Lake marshes each year during migration.
- 1.5 million eared grebes use the Great Salt Lake during migration, which is one of the two largest migration staging population areas of the species in North America.
- Gunnison Island on Great Salt Lake supports 20,000 breeding adult white pelicans during peak nesting seasons.
- The Great Salt Lake has approximately 7,500 white-faced ibis breeding adults, which is the largest breeding concentrations in the world.
- Some 10,000 snowy plovers, the world's largest assemblage, are found at the Great Salt Lake. This represents the largest breeding population west of the Rocky Mountains.
- The Great Salt Lake supports a nesting population of 160,000 California gulls, the world's largest breeding concentration.
- The world's largest migration staging concentration of Wilson's phalaropes occurs at the Great Salt Lake. Each June some 500,000 birds gather to regain ¾ of their body weight to continue their southward migration.
- The Jordan River delta is second only to the Bear River in hydrologic inflows to the Great Salt Lake. Just one of the components of Jordan River generated freshwater marshes (Farmington Bay), has supported 11,000 green-winged teal, 12,100 northern pintails, 9,200 ruddy ducks, 9,000 northern shovelers, 9,300 American avocets, 3,000 California gulls, and many more species on average for the last five years during the April through September period.

The wetlands of the Great Salt Lake thus have a level of national and international significance and importance that we believe must be factored into any decision regarding the discharge of contaminants into the Lake.

Our partners have invested significantly into the long-term conservation of the Great Salt Lake wetlands. These partners have, through a federal grant process, expended $8.6 million to apply 25,150 acres of conservation practices to these

Comments to Letter 03-62 (cont)

Letter 03-62 (cont)

wetlands. These partners, who include private individuals, corporate and business entities, non-governmental conservation organizations, and state agencies, have matched every federal grant dollar with $1.81 of non-federal funds.

We are aware that many other federal, state and private organizations and individuals have expended a great deal more funding than the specific partnerships mentioned above toward the same goal. Simply stated, a wide cross-section of our community continues to work together to conserve these vital resources.

62-2 As previously stated, our concerns center on the discharge of contaminants, specifically selenium and salts, into the Jordan River and the Great Salt Lake wetlands. Please allow me to list the substance of our concerns, the technical portions of which are based on review of the *Guidelines for Interpretation of the Biological Effects of Selected Constituents in Biota, Water, and Sediment; National Irrigation Water Quality Program Information Report No. 3; 1998, USDI:*

1. All incidents of selenium poisoning of fish and wildlife have occurred in terminal basins, wetlands, or sinks, such as the Great Salt Lake wetlands.

2. Potentially, selenium is an extremely toxic element (more toxic than arsenic or mercury) in that there is a very narrow margin between selenium deficiency and toxicity in vertebrates.

3. Toxic effects on birds have been documented where concentrations of selenium are as little as five-to-ten-times normal background levels.

4. Studies at our own (Utah) Ouray National Wildlife Refuge in the Uinta Basin demonstrate the rapid rate of accumulation of selenium in bird tissues. These accumulations were found to dramatically exceed the level of selenium in water sources.

5. We believe the level of selenium found in water samples are a very poor measure of the element in the ecosystem since selenium levels are always concentrated at higher levels in invertebrates, plant tissues, and avian tissues and eggs. Thus bioaccumulation is the real concern with discharge of contaminants into the Great Salt Lake ecosystem.

6. We agree with UDWQ's assessment that the saline water quality of the Great Salt Lake itself, in all probability, will not be significantly affected by the proposed action. Unfortunately, the contaminants (selenium and salts) will largely be deposited in the freshwater of Great Salt Lake wetlands at concentrations that will likely be accumulated in sediments at levels of concern.

Comments to Letter 03-62 (cont)

62-2 The DEQ Division of Water Quality is initiating studies in conjunction with Stakeholders to establish numeric standards for the Great Salt Lake. As indicated in the Response to Common Comment No. 9, selenium will be the first metal to be evaluated.

Letter 03-62 (cont)

7. We are unable to determine that your proposal to discharge selenium and other contaminants into the Great Salt Lake ecosystem considers in any way the issue of bioaccumulation and the potential, resultant impacts of this discharge on the biological elements of the Jordan River or the Great Salt Lake wetlands.

It is not appropriate for us to criticize your discharge plan without offering some constructive suggestions. Therefore, we offer the following suggestions for your consideration before you implement the discharge of selenium and other contaminants into the Jordan River:

1. Develop a risk assessment on the biological elements and bioaccumulation levels which will occur in the Great Salt Lake wetlands. This would require the determination of water quality in the Great Salt Lake wetlands as well as determination of the fate of water-borne selenium in sediments and the various biological elements of the wetlands. This assessment would provide the basis for an informed decision regarding contaminant discharge into the Jordan River and the Great Salt Lake wetlands.

2. From this analysis we suggest you consider the establishment of an acceptable threshold level of selenium and other contaminants at which you would halt the discharge of additional contaminants to the Great Salt Lake wetlands. In other words, you could answer the question, at what point you would cease sending contaminants down the Jordan River should the damage to the biological resources of the Great Salt Lake wetlands become evident?

62-3 Although we suggest a "threshold" approach, we have real concerns about the drawbacks of such an approach. First, once implemented, the practicality of reversing your decision to dispose of selenium and other contaminants into the Jordan River and Great Salt Lake wetlands would make it very difficult to halt this disposal method. Your large investment in the discharge system would render a reversal of your decision to discharge as impractical. Further, it is likely by the time such a decision would be made (based on toxicity levels in the biological components of the ecosystem), the damage of bioaccumulation would have been done. Under these circumstances, the concentrated levels of selenium and other contaminants in Great Salt Lake wetland sediments would remain and continue to be taken up into the food chain in the long-term despite your best intentions.

If you choose not to consider these suggestions, we trust you will seek another alternative, such as the discharge of these contaminants to the Kennecott Utah Copper Corporation tailings to the northwest. We believe it is common sense to transfer contaminants to an already contaminated site. Conversely, it is not common sense to transfer contaminants to an area, which is now essentially void of contamination and has highly valued and internationally renowned natural

Comments to letter 03-62 (cont)

62-3 See the Response to Common Comment Nos. 6 and 7 regarding options identified in the revised Proposal.

Letter 03-62 (cont)

resources.

Prudence dictates the selection of another, more sensible alternative to dumping contaminants in the Jordan River which would deposit and concentrate in the biological elements of the Great Salt Lake wetlands.

We would appreciate your response as to the feasibility and appropriateness of our recommendations. Thank you again for the opportunity to make comment.

Sincerely,

Mark Biddlecomb
Board Chairman

cc: Jim Cole

Comments to Letter 03-62 (cont)

Letter 03-63

November 12, 2003

Dianne R. Nielson, NRD Trustee
Utah Department of Environmental Quality
P.O. Box 144810
Salt Lake City, UT 84114-4810

Dear Ms. Nielson:

63-1 Kennecott needs to be responsible for the thousands of tons of contaminants that they are trying to flush down the Jordan River.

The Great Salt Lake is not a toilet to be used by one of the largest known polluters (Kennecott) of air, water and environment known to man.

Kennecott has made billions of dollars from its mining operation, as has its parent company Rio Tinto. They should be made to part with the insignificant pennies it would cost this ugly industrial giant to keep waters safe for us, our children and their children.

This problem can be taken care of by technology if it's paid for by the culprit.

Sincerely,

Greg Pollock

Comments to Letter 03-63

63-1 Jordan Valley Water Conservancy District has withdrawn their permit to discharge to the Jordan River, as indicated in the Response to Common Comment No. 8.

Letter 03-64

RIVERTON CITY

NOV 2003

November 13, 2003

Dianne R. Nielson, Ph.D.
NRD Trustee
Utah Department of Environmental Quality
P.O. Box 144810
Salt Lake City, Utah 84114-4810

Re: Southwest Jordan Valley Ground Water Cleanup

Dear Dr. Nielson:

Thank you for your attention to our letter dated October 30, 2003 regarding the Southwest Jordan Valley Ground Water Cleanup. The Jordan Valley Water Conservancy District (JVWCD) and Kennecott met with us and responded to our comments and concerns.

After reviewing the information submitted to us in a letter dated November 10, 2003 by the JVWCD, it is our understanding that the State will be involved in the mitigation of groundwater quality and quantity issues as illustrated on the flow charts attached to JVWCD's letter. We are also satisfied with the response to other issues raised in our letter. A copy of JVWCD's letter is, herewith, transmitted.

64-1 We appreciate the efforts of the Jordan Valley Water Conservancy District and Kennecott to capture groundwater for culinary use that, otherwise, may have been lost. We do not take exception to the proposed ground water cleanup project.

12765 South 1400 West • P.O. Box 429 • Riverton, Utah 84065 • (801) 254-0704 • Fax (801) 254-1810 • www.rivertoncity.com

Comments to Letter 03-64

64-1 See the Response to Common Comment No. 3 regarding support for the aquifer cleanup.

Letter 03-64 (cont)

If you have any questions or require additional information, please contact us.

Sincerely,

RIVERTON CITY

C. W. "Mike" Hutchinson, Jr., P.E.
Public Works Director

c: Honorable R. Mont Evans, Mayor
Mark Cram, City Administrator
David Church, City Attorney
Scott Hill, Water Operations Director
Director, Utah Division of Environmental Response and Remediation
David Ovard, General Manager, Jordan Valley Water Conservancy District
Manager, Strategic Resources, Kennecott Utah Copper Corporation

Comments to Letter 03-64 (cont)

Letter 03-65

November 14, 2003

Dianne R. Nielson
Executive Director
Department of Environmental Quality
168 North 1950 West
SLC, Utah 84116

Re: Southwest Jordan Valley Ground Water Cleanup Project

Dear Dianne,

I am writing this letter in regards to the proposed cleanup project associated with the polluted aquifers due to improper disposal techniques by used by Kennecott.

65-1 I believe that all parties that have a vested interest in the cleanup process agree that the Zone A and B plumes need to be dealt with as soon as possible and decontaminated. The main area of controversy surrounds the dumping of the Zone B concentrated waste

65-2 products into the Jordan River. If the state of Utah allows this to occur, the wetlands located at the south end of the Great Salt Lake could incur a significant buildup of contaminants and could be devastating to all those who benefit from a wonderful resource.

The wetlands surrounding the Great Salt Lake are "one of a kind." Millions of migratory birds utilize this oasis every year and the importance of the entire ecosystem is indisputable. I have enclosed articles from the latest Ducks Unlimited magazine issues, (September/October and November/December), that summarize the importance of the Great Salt Lake wetlands.

I have a hard time believing that the Department of Environmental Quality is going to allow the cleanup of one water source by polluting another. Please deny the permits that would allow the contaminants to be released into the Jordan River and threaten the existence of an entire ecosystem.

Thank you for your time,

Amy Kershaw

Amy Kershaw

Comments to Letter 03-65

65-1 See the Response to Common Comment No. 3 regarding support for aquifer cleanup.

65-2 Jordan Valley Water Conservancy District has withdrawn its permit and there will be no discharge to the Jordan River, as indicated in the Response to Common Comment No. 8.

Letter 03-66

DATE: November 16, 2003

TO: Utah Department of Environmental Quality, NRD Trustee
P. O. Box 1448210
Salt Lake City, UT 84114-4810

FROM: Dr. Richard G. and Marjean H. Nielson
Owners of an estate that has both surface and deep aquifer water rights in the arbitrarily defined extended area of the Kennecott contamination plume.

SUBJECT: **Response to the Request for Public Comment Southwest Jordan Valley Ground Water Cleanup Project**

The following item, Section 6.2 Hydrogeology - Groundwater Recharge, appears on page 17 of the Proposal to the Utah State NRD Trustee and USEPA CERCLA Remedial Project Manager for a Groundwater Extraction and Treatment Remedial Project in the Southwestern Jordan Valley.

Section 6.2 – Groundwater Recharge states;

"The principal aquifer is recharged from surface infiltration of precipitation, irrigation water and canal water, bedrock inflow and to a limited extent surface infiltration of waters emanating from Butterfield Creek. ... Aquifer recharge is greater in the eastern part of the southwestern Jordan Valley and in the Herriman area due to recharge from surface water."

Information Taken from USGS Fact Sheet 106-00 July 2000 Relative to Infiltration into the Principal Aquifer

66-1 The following is a compilation of informational items taken from the USGS Fact Sheet 106-00, July 2000 Quality of Shallow Ground Water in Areas of Recent Residential and Commercial Development in Salt Lake Valley, Utah, 1999. These information items are presented to document the uncertainty of our current understanding of contamination levels in the shallow aquifer over the entire valley, and also the uncertainty of how contamination in the shallow aquifer may transfer to the deeper public supply aquifer.

More data is needed to resolve these uncertainties. The uncertainties need to be resolved prior to embarking on projects that will have significant impact on the deep-water aquifer. Projects such as the Southwest Jordan Valley Ground Water Cleanup Project, should only be allowed to proceed, provided they take the responsibility to obtain the necessary funding for an independent agency, such as USGS, to conduct a study that would expand our understanding of both shallow and deep ground water movement, and the potential transfer of contaminants from the shallow aquifer into the deep water aquifer. This study should be finalized prior to the commencement of the cleanup project. The Southwest Jordan Valley Project, while promulgated as an attempt to reduce contaminants in the deep water aquifer, may actually result in the introduction of contaminants into the deep water aquifer that are currently found in the shallow aquifer.

66-2 The following informational items from a 1999 USGS report are offered in support of the above claim. The numbered items are taken from the text of the study; the bulleted items are our comments and/or questions drawn from the USGS report information.

1- USGS Fact Sheet 106-00 is a brief summary of data collected by the United States Geological Survey office in 1999. The data collected came from 30 sample wells located within a small 80 square mile area, of the nearly 400 square mile Salt Lake Valley ground water aquifer. Data was collected to determine levels of three types of contaminants having accumulated in the shallow aquifer within the study area. The three types of contaminants were those that enter the water aquifer as a result of human activities. Nitrates, pesticides, and volatile organic compounds were the types of contaminants found.

- *Are concentration levels of these contaminants cumulative? Should practices and/or pubic participation be instituted to begin reducing future sources of contamination? What are the*

Comments to Letter 03-66

In addition to the following comments, see the Responses to Common Comments.

66-1 The planned extraction rates for the Zone B wells are relatively low at less than 350 gpm per well, except for one well site within the west portion of the plume area to be pumped at approximately 1200 gpm. Modeling for the Zone B area shows on average less than, 10 feet of draw down over 40 years of pumping within the layer that is being pumped. The shallow and deep aquifers are one aquifer in the western portion of Zone B so there is already communication throughout the aquifer. For those wells pumped at less than 350 gpm, the deep aquifer should provide water laterally and up gradient from each well and the recharge feeding the deep aquifer will come from regional infiltration and from seepage from the canals west of the wells. Water quality will be monitored from all pumping wells throughout the time of pumping. Water quality measurements also can be made for deep wells located in the confined deep aquifer for changes over time. Monitoring of the pumping wells along with monitoring of select deep private wells in the confined deep aquifer will be conducted as necessary to check for movement of the shallow unconfined aquifer into the deep aquifer. Since recharge for the Zone B area generally exceeds the volume extracted (canals lose approximately one to one and half cubic feet per second per linear mile of canal) one would not expect the deep aquifer to take on shallow aquifer water.

The groundwater in the southwestern Jordan Valley has been intensively studied over the last decade and that information has been considered in developing the groundwater cleanup program. See also the Responses to Common Comments Nos. 2 and 6.

66-2 Contaminants would generally be expected to move along with the groundwater and not accumulate. In addition to State and county regulations regarding groundwater discharges, source control measures are in place to avoid additional loading of contaminants in the aquifer. It is plausible that as the agricultural areas are phased out, fewer organic compounds will infiltrate to the groundwater. However, if over-watering occurs on lawns and gardens and this water infiltrates to groundwater, then organic contaminants will continue to show up in the shallow unconfined aquifer. Levels of organic contaminants will be monitored in the remedial pumping wells to assess quantities. Significant changes in organic contaminant levels compared to 10 years ago are not expected due to placement of storm and sewer systems and reduced agricultural influences. See also the Responses to Common Comments Nos. 1 and 10.

Letter 03-66 (cont)

current levels of contamination given that nearly 10 years have passed since systematic data was last collected?

66-3

2- Of the thirty shallow wells within the 80 square mile area, eight (8) wells were located west of the Jordan River, between 90th South and 6200 South. The remaining 22 wells consisted of wells west of the Jordan River between 6200 South and 2100 South, and wells east of the river between 6200 South and 13400 South.

- *Most of the area involving the Kennecott contaminated plume was not included in this study area.*

66-4

3. Most of the samples taken from the 30 wells were within acceptable EPA limits for drinking water. Only four (4) samples taken from the 30 sample wells revealed contamination levels that exceeded the EPA maximum contaminant levels for drinking water. Water quality samples taken in 1999 were limited to areas of residential/commercial development that had taken place between 1963 and 1994. The population in the valley doubled through the 1963-1994 time Frame. Areas of development between 1995 and 1999 were excluded from the study because at least five years were considered necessary to pass for the shallow aquifer to show signs of contamination from residential/commercial development.

- *The levels of contaminants found in the shallow aquifer from the 1999 study are not extremely alarming from the perspective of the findings of the magnitude of the concentrations of the contaminants. What is alarming is the thought of what the present levels of contamination might be, as well as their extent, and location, now that nearly 10 years has passed since data was last collected!*

66-5

4. Data for shallow aquifer contamination is not available from the impact of residential/commercial development that has occurred since 1994. If the same research design for the 1999 study were followed today, samples taken in 2003 would not provide reliable data for any area of development having been completed since 1998. Shallow aquifer water contamination from development as recent as 2003 could not be reliably sampled for a five-year period, until 2008.

- *Residential/commercial development has increased dramatically since 1994, and will likely continue at a rapid pace well into the future. Knowledge of contamination levels must be updated and levels continually monitored. A method of forecasting future anticipated levels of contaminants should be developed and implemented to provide a standard or baseline to measure against as a means of dealing with the lag time between presence of measurable contamination following development. These types of procedures must be implemented to avoid contamination of the ground water quality that could result in a significant public health hazard.*

66-6

5. Contamination levels for all substances tested were highest for wells on the west side of the Salt Lake Valley. The study suggested the reason for higher concentrations of contaminants in the shallow aquifer on the west side were not clearly understood. Factors such as particular land uses, aquifer properties such as recharge rate, and geological characteristics affecting transmissivity, or a combination of all these factors may be responsible for the higher levels of contaminants on the west side.

- *Why are contamination levels higher on the west side of the valley? Can these higher concentrations of contaminants on the west side be controlled/reduced? What effects would these higher levels of contaminants have on individual water wells, and wells both deep and shallow, proposed for use in the clean-up project located within the aquifer clean-up area?*

66-7

6. There is rapid movement of water from the land surface into shallow ground water. The deeper confined aquifer used for public supply is vulnerable to contamination from the shallow aquifer because the potential exists for water to move downward from the shallow aquifer.

Comments to letter 03-66 (cont)

66-3 The comment is noted. Levels of organic contaminants might be expected to increase through irrigation wastewater, irrigation infiltration water, and commercial/industrial facility activities unrelated to the groundwater remediation project. Since the system drains to the Jordan River, it is conceivable that there will be increases in the shallow aquifer adjacent to the river. Organic contaminants will be monitored in the remedial pumping wells.

66-4 The comment is noted.

66-5 The joint proposal is concerned with contamination from mining activities. The proposal does have a plan for providing a baseline of current contamination from mining activities and a method for updating and modeling continued migration of contaminants. Samples within the contaminated area will be collected on a quarterly, semi-annual or annual basis as necessary. These results will be incorporated into the on-going modeling effort to refine predictions of future contamination migration.

66-6 Higher organic contaminants on the west side may be due to the fact that more cultivated acreage existed on the west side of the river along with a later developed storm and sewer drainage systems. It also may be a function of poorer drainage. As previously pointed out by the commenter, the majority of the well samples were collected north of the mining affected area. The actual level of organic contaminants in individual water wells (both deep and shallow) would not be expected to increase but rather to decrease over time. The proposed project under the Joint Proposal does not mitigate new non-mining related contaminant sources, nor is it required to do so under the terms of the Consent Decree.

66-7 The deep aquifer in Zone B is targeted for pumping because it is contaminated and the water quality does not meet JVWCD standards for culinary supply. Because the pumping rates are relatively low for the remedial wells, the projected draw down is small and minimal shallow aquifer water would recharge the deep aquifer. See also prior responses.

Letter 03-66 (cont)

- *Logic says pumping down the level of the deeper aquifer increases the potential for downward movement of water from the shallow aquifer into the deeper aquifer, resulting in the introduction of shallow aquifer contaminants into the public drinking-water supply. Doesn't responsible development and preservation of the deep-water aquifer require a clear understanding of the potential for its contamination by water from the shallow aquifer?*

66-8

7. More than half of the valleys population utilizes ground water for household use. More data and its interpretation are needed to determine the occurrence, distribution levels, and sources of contaminants in both the shallow aquifer and the deeper drinking water supply aquifers of the Salt lake Valley. More information is needed on the movement of ground water in the Salt Lake Valley.

   - *Shouldn't all decisions regarding utilization of the ground water supply for household use be based on a clear understanding of both the shallow and deep aquifers and the potential interactions between them? The reclaimed water from the clean-up project is intended for household use.*

66-9

NOTE:

New technology has been developed since 1999 that could provide information that would eliminate the uncertainties and questions existing about both the shallow and deep aquifers.

We must utilize lessons from the past to guide the future development of the Salt Lake valley ground water resource.

The KUCC contamination was recognized to be happening as early as 1966. Leakage from water storage ponds near Copperton was known to be occurring at that date. The underground contamination plume was first discovered in the early 1980's. The source of contamination was not corrected until 1993. Approximately 27 years of contamination occurred prior to any corrective action being taken.

Shallow ground water contaminants were measured in 1999 that were the result of human activity in areas of the valley, which were developed between 1963 and 1994. Contamination samples taken in these areas of study represent levels resulting from as few as five years since development took place, to as many as 30 years since development occurred. Nothing is known of the shallow aquifer contaminant levels in areas that have been developed during the last nine years.

Elements of the new water management plan appear to be paving the way for history to be repeating itself. In these two previous examples, contamination was known to be taking place but our knowledge of the level and scope of contamination was not keeping pace with the actual ongoing process of contamination. In both cases, our knowledge proved to be woefully lagging behind what was and is actually happening to the ground water supply. This is a circumstance or cycle that must not be repeated with the ground water remediation projects.

66-10

The present mitigation remediation plans appear to be based on an assumption that there could be (will be) no potential negative impacts to the ground water supply from the remediation activities. However, item 8.0 of the new ground water management plan does commit The Division of Water Rights to ... " review new pertinent data that further, or more accurately, defines the ground water flow system and hydrogeology of Salt Lake Valley and will modify the plan if necessary." This statement clearly shows that future potential problems are recognized as being possible. A plan that calls only for the review of new pertinent data, that further or more accurately defines the ground water flow system and hydrogeology of the Salt Lake Valley, is clearly an admission that a deliberate plan, based on more accurate and factual information, for the management of the southwest water remediation project still remains to be prepared. It is important to note that the mathematical model used to help formulate the proposed cleanup plan did not include human activity contaminants, from the shallow aquifer, as one of the potential sources of contamination of the principal aquifer.

Comments to Letter 03-66 (cont)

66-8 The monitoring and extraction wells in the Zone B area comprise a large database; the data provided from these wells was used to develop the remedial plan. See the Responses to Common Comments Nos. 2, 5, and 6.

66-9 The comment is noted. There is considerable understanding of both the hydrogeology of the Salt Lake Valley groundwater system and of the contaminants in the southwestern part of the valley. It would be irresponsible to delay action to cleanup and contain know contamination, given the current information and the ability to implement groundwater restoration in the Affected Area.

66-10 The comment is noted. It is good practice to continue monitoring and collecting data to continually refine the understanding of the effects of the remediation in light of all ongoing activities.

Section 8.0 of the Salt Lake Valley Groundwater Management Plan does not necessarily refer to the southwest portion of the valley. This area is probably the most thoroughly monitored and most carefully modeled region of the entire valley. New data will most likely be related to the shallow aquifer and its relation to the rest of the hydro-geologic system.

Letter 03-66 (cont)

Water Rights Issues and the Mitigation Plan

The following comments pertain to a request for restrictions on future water development in the southwest Jordan Valley, proposed to the State Engineer by KUCC in 1999. The stated purpose claimed for these restrictions was to facilitate the remedial process and prevent further migration of existing contamination. These restrictions involved limitations on completion depths and pumping rates on future wells drilled near the KUCC contaminated area. Prohibition of new well development within the sulfate isoconcentration line in the KUCC evaporation pond area, until plume containment and acceptable contamination levels are achieved, was also requested. The following quotation was taken from article 7.3 Proposal to the State Engineer Concerning Water Rights, contained in the Proposal to the Utah State NRD Trustee and USEPA CERCLA Remedial Project Manager for a Groundwater Extraction and Treatment Remedial Project in the Southwestern Jordan Valley.

> **" The practical aspects of this request were incorporated in the State Groundwater Management Plan issued by the State Engineer in 2002 (Appendix E). Specific details regarding groundwater management in the southwest Jordan Valley are detailed in this plan."**

Concerns with the Salt Lake Groundwater Management Plan As it Relates to the Groundwater Remediation Proposal

The Salt Lake Valley Groundwater Management Plan states;

> **"The objectives of this ground-water management plan are to promote wise use of the ground-water resource, to protect existing water rights, and to address water quality issues and over-appropriation of ground water in the valley."**

CONCERNS

66-11

The language in this statement of objectives is inconsistent with the mitigation language from KUCC and with the items in the management plan that deals with the southwest valley clean-up project. The Salt Lake Valley Groundwater Management Plan was implemented on a permanent basis rather than an interim basis on June 25, 2002. This plan contains policy on ground water withdrawals from the southwestern portion of the valley. Specifically, items 2.0; 2.2; 2.3; 3.0 #4 a, b, c; 6.0; and 8.0 contain regulations that directly affect individual water wells in the Southwest valley. These items constitute the implementation of permanent regulations prior to the conclusion of the public comment period of November 21, 2003 for the impact on individual water wells by the Southwest Jordan Valley Ground Water Cleanup Project. These policy statements were also implemented prior to the closure of the public comment regarding the processes outlined in the mitigation plans for the principal aquifer. These six statements in the management plan provide favored status for the ground water remediation plan through the explicit removal of obstacles that might interfere with the plan. These six items address the issues of **how** the principal aquifer will be managed relative to the remediation plan. The Management Plan as permanently implemented did not disclose the potential negative impacts that became evident in the documentation of the proposed Remediation Plan. As a consequence these six policy statements serve to limit (and specifically exclude comment on the **how** issues) public comment regarding potential problems, as well as specific concerns regarding the implementation of the ground water remediation plan.

66-12

Our recommendations and concerns addressing **how** the water management plan facilitates negative impacts to individual wells, and the water resources of the entire valley, resulting from implementation of the remediation plan, are nullified by the inclusion of these six specific items in the management plan when combined with the claim of permanent implementation of the management plan as of **June 25, 2002**. We object to this limitation on public comment regarding the impact of the Management Plan on individual water wells and the water resource. Public comment, on the agreements for cleaning up the sulfate-contaminated ground water, and for impacts of the remediation plan on individual water wells, is open until Nov. 21, 2003. Both the water management plan and the remediation plan deal with the agreements for cleaning up the sulfate contaminated ground water. In order that our comments not be limited with regard to this issue, they must be allowed to apply to

Comments to Letter 03-66 (cont)

66-11 Modeling and maps were provided to the State Engineer to help him make his decisions. Additionally, although outside the scope of the public review process for the Joint Proposal, the public is involved in the State Engineers decision making process. Also see the Response to Common Comment No. 1 regarding public involvement.

66-12 The need to cleanup the aquifer and limit the spread of contamination is driving this remedial plan. The plan proposes to restore and place groundwater to beneficial use. It should be noted that the 1995 Natural Resource Damage Consent Decree (NRD CD) does not settle third party claims against Kennecott. In reaching the 1995 settlement, the State settled on damages to a resource that the State holds in Trust for the citizens of Utah. Public involvement and well owner issues are also addressed in the Responses to Common Comments Nos. 1 and 10.

Letter 03-66 (cont)

both documents where ever appropriate. If public comment were not allowed to apply to both documents then those comments would be reduced to issues that have no significant value with regard to the implementation of a plan that is recognized by language contained within the plan itself, to have potential negative impacts on individual water wells and the entire ground water resource. Full implementation of the water management plan and the water clean-up plan should be allowed only when decisions related to water quality and over appropriation, can be based on fact rather than assumptions and arbitrary definitions. The language of both plans has permitted excessive scales of implementation, which appear to have been allowed, and even protected in the name of contamination remediation, which may or may not be achieved. Has this been done solely to serve the special interests of residential and commercial development at the expense of the rights of others and the water resource of the entire valley?

66-13

Resolution of painful issues of over-appropriation will be badly exaggerated if they have to be addressed concurrently with a major period of draught, coupled with an irresponsible and arbitrary withdrawal of additional ground-water for a water remediation project that clearly appears to have its priority established and protected by the very agency that also has responsibility to protect the rights of others and the future integrity of the valley water resource.

The language of the new water management plan, that deals directly with the southwest cleanup program, clearly shows that the department of natural resources understands all of the problems related to the wise use of the ground water resource. The language of this new water management plan also clearly raises more questions than it answers when it comes to the implementation of the cleanup plan. Inconsistencies in stated purpose between the management plan and the mitigation plan and the apparent preferential priority assigned to the remediation project, that appears to go far beyond the restrictions requested by KUCC in 1999, are the most serious problems of the management document.

The water management plan cannot have as its objective "the promotion of the wise use of the ground water resource, to protect the existing water rights", and at the same time address water quality and over appropriation issues based upon questionable modeling results and arbitrary definitions of areas of contamination, a reckless implementation of a water remediation plan that will result in additional contamination in other areas of the valley, and possibly the very area intended to be cleaned up, and that will likely compound the magnitude of over-allocation problems. The above claims are borne out by the elements in the management plan, (Item 2.3 for example includes arbitrary definitions of contamination areas and the apparent abdication of authority by the Division of Natural Resources to KUCC.), and elements in the remediation plan.

Item 2.0 Priority Dates

66-14

... " If excessive withdrawals occur, the state engineer will distribute the water in accordance with the priority dates of the applicable water rights ...".

The Division of Water Rights has allowed JVWCD to purchase water rights originally intended for surface use in other areas of the valley. JVWCD has also been allowed to transfer points of diversion and changes in the original use of these water rights into the southwest valley contamination area. Committing historical surface water resources to new principal aquifer uses, suited to the advancement of the contamination remediation project, only results in the creation of severe problems of localized over-allocation of principal aquifer water resources. This practice then requires the development of policy to govern localized ground water withdrawals.

66-15

Kennecott contamination of the ground water was officially confirmed as early as 1983. Water retention ponds, which were the source of the Kennecott contamination, were used for a period of 33 years up until the year 2000. **All water shares originally intended for use outside of a contaminated area and transferred into an area of known contamination, which have not already been put to beneficial use prior to the known existence of contamination in 1983, should be subject to revised priority dates.** Private well owners, in the area of contamination, should not be impacted by a retroactive implementation of water shares originally intended for other uses or places of use outside the area of contamination. JVWCD should be held responsible if they have purposely transferred water shares into an area identified as contaminated. All hint of

Comments to Letter 03-66 (cont)

66-13 The comments are noted. JVWCD and Kennecott have water rights in the Affected Area. In accordance with the Consent Decree, those water rights will be used in make the treated water available to the public. Further information on well owner issues is available in the Response to Common Comment No. 10. Additional contamination will not occur in other areas of the valley as a result of the remediation plan.

66-14 The purchase of water rights is subject to the market, not dictated by the State Engineer. JVWCD has not submitted any water right application to move surface water rights to principal aquifer uses. Instead, JVWCD has submitted a change application to change the point of diversion of surface irrigation waters to shallow aquifer wells adjacent to the Jordan River.

66-15 No reestablishment of priority dates is necessary as part of the remediation project, nor is such reestablishment within the Trustee's authority. Water right priority dates are under the authority of the Utah State Engineer, and will remain unchanged by the proposed project. This is in

Letter 03-66 (cont)

any agency attempting to embark on a long-range plan for the deliberate manipulation of the environment and the valley ground water quality and quantity must be avoided. If this type of activity were to be taking place it would seriously jeopardize the public trust in the Division of Water Rights. A well thought out method for the reestablishment of priority dates is a key element in a water management plan for a contaminated area. As a matter of consistency, all private well owners who have transferred water rights into a known contaminated area should have revised priority dates assigned, based on when their first withdrawal from the deep aquifer was made, unless that first withdrawal date was prior to 1983, in the case of the southwest area.

Full disclosure of the history of the water rights the JVWCD has been filing renewal applications on for the last 50 years should be required. If these water rights have been historically transferred into the area of the Kennecott contamination plume which is now limited by item 3.0 #4, a, b, c, from having rights transferred in by the (TIN) restrictions, then the priority dates for the transferred rights should be revised to a date when the water is first withdrawn for beneficial use from the deep aquifer at the new location.

Item 2.2 Localized Ground Water Withdrawals

... " the state engineer may limit the withdrawals in that area according to the priority dates of each applicable water right in harmony with all applicable state statutes. ...Further pumping restrictions may also be imposed if harm to the ground-water system worsens. Pumping restrictions may also be lifted in part or in whole after the ground-water system has recovered to an acceptable level, provided no future reoccurrences of the conditions which caused the harm are anticipated."

Instead of trying to regulate over-allocation problems with ground water withdrawal limitations, why not acknowledge the possibility that past practices of allowing purchase of water rights and transferring them to other areas has now begun to result in severe localized over-allocation problems. A simple change in policy with regard to priority dates might serve as a more natural means of control in dealing with over-allocation. Such a change in policy would also aid in protecting existing water rights in localized areas. Municipal policies that require submission of water rights by developers as a condition of obtaining building permits has contributed to the problem of localized over allocation through the purchase and transfer of water rights into specific areas scheduled for development. Such municipal practices appear to have now begun to drive the management of the valley ground water resource. There is no statement in the new management plan either acknowledging, banning, or controlling this practice. Who is in charge of managing our water resource, the Division of Water Rights, or policies and practices established by local municipalities? Ground water withdrawals lead to pumping restrictions. The relevant factors included in item 2.2 that will govern future pumping restrictions are:

66-16

66-17

a. Ground water level trends - *Trends reported for the recent past by KUCC and JVWCD show a decline in the water level of the principal aquifer in the SWJV to be on the order of **4-8 feet per year**. This reported declining trend occurred from 1986 until 1996. No information was included on declining levels over the last five (5) continuous years of drought.*

66-18

b. Trends in the amount of ground water withdrawals – *withdrawals by KUCC and JVWCD will be greatly increased, but their increases are protected by item 6.0. Significant new amounts of yearly withdrawal will result due to the operation of five proposed shallow wells, and seven deep groundwater wells in Zone B for a combined rate of, (4525 gpm), and twelve deep groundwater wells in Zone A for a combined rate of (5600 gpm). The amount of withdrawal proposed by the cleanup plan goes far beyond what is characterized as a trend.*

66-19

c. Changes in water quality – *Increased draw down has a definite potential for allowing contamination entering from the shallow aquifer into individual wells, municipal supply wells, and planned remediation wells.*

d. Local hydro-geologic conditions – *The clay layers separating the shallow and deep aquifers are less prevalent in the southwest region of the valley. This factor could result in serious additional principal aquifer contamination from the shallow aquifer.*

Item 2.3 Ground-Water Withdrawals From the Southwestern Portion of the Valley

Comments to Letter 03-66 (cont)

accordance with the 1995 Consent Decree, which states in Article 4 that "allocation of the right to use surface or groundwater resources by the public shall be by the Utah State Engineer pursuant to Utah Water Law." Thus, existing water rights and Utah water law will prevail in the proposed project.

66-16 As it relates to the Consent Decree and this remediation project, "allocation of the right to use surface or groundwater resources by the public shall be by the Utah State Engineer pursuant to Utah Water Law." Consent Decree, Article 4.

66-17 The trends for the Zone A area have continued as they were from 1986 to 1996 while the Zone B area has less change, due to recharge from the canals. The continued water level decline in the Zone A area has been allowed and will continue to be allowed to contain the contaminated groundwater. From 1996 to 2003, the water levels have dropped from 0 to 28 feet for the Zone A area, or 0 to 4 feet per year. The proposed Zone B and Lost Use groundwater extractions have not begun. However, water levels monitored in Zone B areas have dropped from 0 to 15 feet, or 0 to 2 feet per year, for that same period.

66-18 The rates of extraction were revised for Zone B and Lost Use wells in the Revised Joint Proposal (6/11/04, Section 5.3). The Consent Decree requires the production of 7000 acre feet per year of water from the deep aquifer and provides for production of 1235 acre feet of Lost Use water as part of the natural resource damage claim. Extractions to contain the acid plume are additional. All extractions will be completed under valid water rights.

66-19 In the western portion of the southwest region of the valley, the aquifer is not confined. The western portion of Zone B also is not confined. Therefore any contaminants that infiltrate these areas will indeed move into the principal aquifer, irrespective of drawdown.

Letter 03-66 (cont)

Item 2.3 states:

..."As part of the remediation effort, Kennecott Utah Copper Corporation (KUCC) has committed to assist affected water users obtain adequate replacement water if adversely affected. Applications in this area, which propose to change the point of diversion or drill a replacement well, will be critically reviewed so as not to interfere with the remediation process. In conjunction with this, KUCC has committed to work with applicants to determine if there is a feasible well location, depth, and pumping rate for future wells in the contaminated area. The contaminated area is defined as extending 3000 feet from the known 250-mg/l sulfate isoconcentation contour. "...

This item raises many issues that are causes for concern.

CONCERNS:

66-20

a. *Who decides what is adequate replacement water?*

b. *Whose future wells?*
Private, or KUCC's wells?
New wells, or replacement wells?

c. *What has caused the remediation process to be given such a high priority that it can not be interfered with by private well owners who expect their existing water rights and personal rights to be protected?*

d. *Is the Division of Water Rights abdicating its responsibility for approval of new or replacement wells to KUCC?*
Another layer of bureaucracy?
If so, for how long? And why?
How much authority will be turned over to KUCC?

66-21

e. *Extending the contaminated area 3,000 feet beyond the known contaminated area is an arbitrary decision that should be replaced by a requirement to accurately determine the ground water flow system and hydrogeology of the Salt Lake Valley.*

An area of the ground water system is either contaminated or is not contaminated according to water quality samples. It is not contaminated by definition. Is this arbitrary tactic being employed as a result of an inadequate understanding of the ground water flow system and hydrogeology of the Salt Lake Valley prior to commencing the remediation project? No one knows the extent of potential negative impacts that might result from the remediation project. Artesian wells are an example of what is not known about the ground water flow system and hydrogeology. Artesian well water is potentially coming from a source different from the Salt Lake Valley deep aquifer.

Personal property rights for all wells included in the defined area of contamination have been subjected to arbitrary devaluation. Future refinancing and sales of homes utilizing private well water for domestic supply could be jeopardized by an arbitrary inclusion in the area of contamination.

Private well water for domestic use could be eliminated as a result of contamination classification by definition. Utilization of the municipal water system could then be imposed as mandatory to refinance or sell a home. What would then become of the private water rights for domestic use?

f. *A reasonable alternative to an arbitrarily defined expansion of the remediation project contamination area is the reliance on current knowledge of the known, or an updated determination of the, extent of the contamination plume. This knowledge should be coupled with a study, using available new technology, to accurately determine the ground water flow system and the hydrogeology of the Salt Lake Valley. This step should be followed by a scaled-down, limited, implementation of the remediation plan that includes a strategic, on-going, aquifer-monitoring program. The data from this monitoring program should demonstrate that the remediation process is working without causing additional harm before the program is allowed to proceed and/or be expanded.*

Comments to Letter 03-66 (cont)

66-20 See the Response to Common Comment No. 10. Also note that under the Consent Decree "allocation of the right to use surface or groundwater resources by the public shall be by the Utah State Engineer pursuant to Utah Water Law." Consent Decree, Article 4.

66-21 See the Response to Common Comment No. 2 regarding characterization of groundwater contamination. The remediation is designed to remove contamination from the aquifer and limit the spread of sulfate contamination. The Consent Decree does not settle third party claims; nor does the Trustee have that authority.

Letter 03-66 (cont)

66-22

g. *Is the arbitrary 3,000-foot definition a decision intended to protect the remediation project or private well owners? Whose interests should be protected? Both parties with equal priority or the party with higher priority?*

*The remediation plan appears **not** to have elimination of contaminants from the groundwater resource as a primary objective. The remediation plan is impaired by its reliance on multiple objectives for the withdrawal of water from the ground water resource, at the expense of the environment, the ground water resource quality and quantity, and existing water rights, all to serve the special interests of KUCC, Municipalities, Jordan Valley Water Conservancy District, and other residential/commercial developers.*

Item 3.0 Applications to Change the Point of Diversion, Place of Use, and /or Purpose of Use
Number 4 states:

"Change applications that propose to transfer water rights into a section where the transfer Index Number (TIN) under the current water rights exceed the limits set forth in table 2 below will only be considered if the applicant can show that:

a) There is sufficient reason to believe that existing water rights will not be impaired.
b) Compensation and/or adequate replacement water will be provided to existing water right holders if impairment occurs.
c) Additional ground-water withdrawals will not significantly reduce water levels, degrade the water quality, or otherwise negatively impact the ground water system."

66-23

Private individuals could not meet the requirements of item 3.0 #4 as a measure to head off the potential negative impacts on their own existing water wells which may result from the implementation of the contamination clean up project. The requirements of 3.0 exclude individual rights in favor of organizations with large financial and technical resources. This policy appears to be a violation of the equal protection clause of the Constitution of the United States of America. This policy serves to protect the water remediation plan as it specifically involves the central region. The central region, as shown in Figure 1 of the Salt Lake Ground-Water Management Plan is identified as a region for which it is permissible to transfer water rights into from both the western and eastern regions. Changes to the point of diversion, place of use, and purpose of use, are elements that are changed in the process of transfer of water rights. Consideration of these elements should play a major role in the establishment and possible revision of the priority dates for water rights that are transferred. Water rights used in close proximity of the original place of use, and for the same original purposes should be granted changes in points of diversion without having revisions to their priority dates. Policy 3.0 #4 does not protect the water rights of individual wells. To the contrary, through the process of water right transfer it establishes the mechanism for the favored status of the clean up plan at the expense of individual well rights. It also opens the door to serious localized problems of over-allocation as a consequence of the transfer process. If the current management plan policies dealing with over allocation, combined with the protections guaranteed to the clean up plan, are implemented in the central region, there could be major negative impacts to individual water rights in this area of the valley. Excessive withdrawal of shallow water resources could undermine utilization of existing shallow well water rights for irrigation and past efforts and financial investments to provide wildlife habitat, nature trails, wetlands and natural open space areas for the public to enjoy.

At the present time, with our current level of knowledge, the requirements of Item 3.0 #4c above cannot possibly be shown by anyone. The current lack of knowledge of the ground water flow system, and hydrogeology of the Salt Lake Valley would negate the validity of any claim submitted by anyone to satisfy the requirements of Item c. This requirement is what much of the concern regarding implementation of the water clean-up plan is about. The implementation of the water clean up plan must be subject to the requirements of Item 3.0 # 4c before it is allowed to proceed. Why has the clean-up project been exempted from a requirement that cannot, at the present time, be satisfied by anyone including KUCC and JVWCD without additional data collection and analysis? Why has the water clean-up plan been exempted from this policy, when everyone else remains subject to the impossibilities of this requirement?

66-24

Item 6.0 Ground Water Remediation Projects

... "In order to allow for remediation of ground water the state engineer may support withdrawal amounts in excess of the regional safe yield values outlined in section 2.1 above or

Comments to Letter 03-66 (cont)

66-22 The 3,000 foot definition was designed to protect all parties. The project outlined by the Joint Proposal is targeted at removal of contaminants from the groundwater, protection of the environment and restoration of the natural resource.

66-23 These comments are better addressed to the Division of Water Rights in a different forum.

66-24 The plan focuses on reducing the spread of contamination and to accomplish this objective, withdrawal rates are matched with containment criteria.

Letter 03-66 (cont)

allow changes that would exceed the limits set forth in section 3.0 above if it is determined to be in the best interest of the public and has a specific project life."

66-25

In our opinion the southwestern valley ground water remediation project has no basis for being exempted from the process of evaluation of excessive withdrawals. It cannot be demonstrated to be in the public interest to allow excessive withdrawal limits if the public were to be negatively affected by that decision. Item 6.0 protects excessive ground water withdrawals that are made possible through localized over allocation of water rights. Both excessive withdrawals and localized over allocation are potential problems enabled by the favored status irresponsibly awarded to the Jordan Valley Water Conservancy District. Removal of the Kennecott contamination is a desirable goal, but at what cost to individuals and other desirable goals for the environment? The proposed 40-50 years is not a realist project life for elimination of the KUCC contamination plume. What criteria have been established to define the achievement of the end of the remediation project?

66-26

Item 8.0 Monitoring Activities and Aquifer Status Update

"The Division of Water Rights will monitor water quality reports submitted by water users to the Department of Environmental Quality and periodically produce an updated, valley-wide water quality summary. Additionally, the division will provide water use information. Also, the division will review new pertinent data that further, or more accurately, defines the ground-water flow system and hydrogeology of Salt Lake Valley and will modify the plan if necessary. Any modifications to the plan will occur in consultation with water users and other interested parties."

Item 8.0 of the management plan permits a process sequence that is flawed in its ability to manage and protect the integrity of the ground water resources. The process places monitoring secondary to implementation, and plan modification if and when more problems are found with valley wide water quality, or water uses, or if the ground water flow system, and the hydrogeology of the Salt Lake Valley have not been adequately determined. Uncertainty of whether the plan will ever be actually modified appears to be based on the perceived seriousness of the problem. After-the-fact problem detection and plan modification will obviously be subject to a great deal of opposition from entrenched and established bad practices and will be an enormous uphill battle. Mistakes made at this point in time, where demands for increased quantity of water from the deep aquifer, are already beginning to stress the system through over-allocation, will be correctable only at greatly elevated levels of stress on the entire human and water resource system.

This strategy for plan modification will surely result in having to make very difficult choices in the future between the protection of water resources and problems created by all development, including the development of the water resources, which will be permitted by full and immediate implementation of the current ground water management plan. This monitoring plan does not represent responsible management of the ground water resource.

66-27

The technology now exists to place contamination prevention and removal ahead of plan implementation and irresponsible resource development. Now is the time to avoid the repetition of past historical practices that have resulted in the difficult circumstance we find ourselves in at the present time.

Data collection and evaluation to determine facts, followed by establishment of a responsible plan to remove contaminants and eliminate over-allocation problems, followed by implementation, and followed by monitoring, is the only responsible management process. What has motivated the irresponsible implementation process related to the remediation projects? Why is there now an apparent urgency attached to the remediation projects? The contamination plume has been known to exist for the past 27 years. Is the urgency only to serve the purposes of special interests?

66-28

Item 8.0 identifies monitoring, as the mechanism for dealing with **how** potential negative impacts on the principal aquifer and individual wells will be managed, as a result of implementing the proposed remediation projects. Damage to individual wells and/or to the aquifer appears to be acceptable provided the remedies allowed do not interfere with the remediation process. The water management plan and the water remediation plan are not independent. Each is dependent on the other. The effects on water quality and quantity issues of one plan govern the effects on water quality and quantity issues of the other. In addition to problems with **how** the principal aquifer will be managed, the vague language of item 8.0 also leaves many unanswered questions regarding who, when, where, what, and why regarding the implementation of the clean up of the acid and

Comments to Letter 03-66 (cont)

66-25 See the Responses to Common Comments Nos. 2, 5, and 10.

66-26 These comments on the Salt Lake Valley Groundwater Management Plan would more appropriately be addressed to the Division of Water Rights in another forum.

66-27 Investigations of the groundwater problems related to mining began in the early 1980s under the direction of the DEQ. The Final Draft Feasibility Study followed in 1998, followed by the RI/FS (remedial investigation, feasibility study) and Record of Decision (ROD) issued by the EPA and DEQ. All included significant technical input from multiple public agencies and organizations. The ROD was subject to a public comment period as well. All of these studies have culminated in the current proposed project. Since there was damage to a natural resource, the NRD Consent Decree provided a mechanism to "restore, replace, or acquire the equivalent of the natural resource for the benefit of the public in the Affected Area."

66-28 Item 8.0 of the Salt Lake Valley Groundwater Management Plan does not necessarily refer to the contamination area in the southwestern part of the valley. There is nothing in the management plan that exempts anyone from the responsibilities or liabilities associated with potential impairment of other water rights.

See the Response to Common Comments No. 10 regarding the response to water rights and water quality concerns.

Letter 03-66 (cont)

sulfate-contaminated ground water. The following are unanswered questions to item 8.0 of the management plan.

UNANSWERED QUESTIONS:

66-29
1. *WHO*
   a. *Who will submit water quality reports? Are individual well owners responsible to report water quality reports to DEQ? If so, when and how often? Who will pay for the cost of the reports?*
   b. *Who are "water users" referred to in item 8.0? Valley wide users? Private well owners? Municipal suppliers?*
   c. *Who should be responsible for analysis and collection of data? Someone with a conflict of interest, or an independent agency?*
   d. *Who stands to gain financially from the implementation of the groundwater remediation project? KUCC? Four Municipalities? Residential / Commercial developers? Jordan Valley Water Conservancy District? State of Utah Division of Natural Resources Water Rights Division? Rio Tinto?*

66-30
   e. *Who stands to lose financially as a result of the implementation of the ground water remediation project? Private Well Owners in the southwest area affected by draw down? Others who may be affected by the relocation of the ground water contaminants to the Jordan River and Great Salt Lake?*
   f. *Who will be the recipients of the decontaminated water? Private well owners whose water rights have been negatively impacted? Individuals in newly proposed commercial/residential development areas who have never financially invested in their own water rights?*

66-31
2. *WHAT*
   a. *What is being sampled? Has a hypothetical model as to what may happen to the ground water supply as a result of the remediation process been developed based upon what is already known? If not, what will govern where, when and why samples are being collected?*

66-32
   b. *What is the plan for the future? What will we be looking for to quickly identify potential problems resulting from implementation of the remediation plan? What are the potential sources of problems that might come from the remediation project? Have we assumed there are none?*

66-33
3. *WHERE*
   a. *Where is it appropriate to mitigate water rights of private well owners? Only in the southwest region where the remediation project is proposed?*

66-34
   b. *Where should water quality samples be systematically drawn to avoid possible additional contamination resulting from the remediation projects?*

66-35
   c. *Where will contaminants from the remediation project be managed? Will they be contained? Will they be allowed to contaminate some other portion of the environment or water supply? If so, what is the point in implementing a so-called ground-water remediation project? Should the Groundwater Contamination Remediation Project be renamed the Groundwater Contamination Relocation Project? Doesn't use of the word Remediation overstate the actual effects of the project? All residents of the Salt Lake Valley have a stake in the potential relocation of contaminants. Please don't mislead the users of the entire Salt Lake Valley water resource with deceptive project labels.*

Comments to Letter 03-66 (cont)

66-29 These comments on the Salt Lake Valley Groundwater Management Plan would more appropriately be addressed to the Division of Water Rights.

66-30 Treated water will be provided to the public in the affected area. Impacts to individual well owners based on quality issues in Zone A and B or water level impacts in Zone A that are specifically related to Kennecott will be addressed through appropriate means to be determined on a case by case basis, and could include such approaches as providing replacement water, deepening wells, or installation of under-sink RO treatment units.

66-31 Flow modeling and solute transport modeling were conducted to assess flow conditions. Sampling will be conducted to assess quality of groundwater over time as compared with extractions quantities and to continually calibrate and update the model to compare actual conditions with projected conditions. Mainly inorganic constituents in the water are being sampled. Groundwater models have been extensively used to predict the potential impacts of the project. The results of this modeling are contained within the appendices of the proposal. Groundwater modeling has also been performed independently by government agencies such as Division of Water Rights.

66-32 The plan under the Joint Proposal is to treat contaminated water for 40 years and to provide such water to the public in the Affected Area. Potential problems include predicted draw down in the Zone A area. This is necessary to prevent lateral (horizontal) movement of contaminated water that might otherwise adversely affect uncontaminated groundwater. Modeling for water quantity for Zone B shows a small draw down.

66-33 The project under consideration is designed to address the region identified by the Consent Decree.

66-34 Please refer to the groundwater-monitoring plan in the Final Remedial Design for the sampling and monitoring information.

66-35 Waste concentrates will be piped to Kennecott's tailing impoundment. Any decision to discharge to the Great Salt Lake from Zone B/Lost Use will be made following studies to set a selenium standard for the Lake. Concentrates will be contained in the tailings impoundment; at certain times of the year, water from the tailings impoundment may discharged to the Great Salt Lake in accordance with Kennecott's existing UPDES permit. Any discharges to the Great Salt Lake will be contained by the lake and must meet UPDES permit requirements. Concentrates will not contaminate groundwater and drinking water. The project removes the contaminants from the groundwater. The contaminants are to be deposited in locations where they will not re-enter drinking water supplies.

Letter 03-66 (cont)

66-36

4. *WHEN*
   a. *When is it anticipated the ground water remediation will be completed? When will mitigation activities begin and end? Will mitigation end at the end of the remediation project? Will mitigation end when KUCC ceases operation?*
   b. *When will implemented mitigation steps be reversed, and individual water rights restored?*
   c. *When is it appropriate to mitigate water rights of private well owner who have a history of putting their water to beneficial use?*
   d. *When must the remediation plan begin to show positive effects?*
   e. *When must the remediation plan be fully operational? Can the project be implemented in small pilot project phases, or must it be put into operation full scale, without consideration of the potential possibility for future negative consequences resulting from implementation of the cleanup plan?*

66-37

5. *WHY*
   a. *Why must the remediation project be implemented in a way that has so much potential for negative impact for private well owners?*
   b. *Why shouldn't the remediation project be implemented in small pilot project stages, guided by a study that has been completed to accurately determine the ground water flow system and hydrogeology of the Salt Lake Valley that includes **all** possible sources of principal aquifer contaminants?*
   c. *Why continue to make assumptions about our ground water supply when the present and futures demands for its use are becoming so critical?*
   d. *Why place increased development of the groundwater supply ahead of understanding the potential limits of the quantity and quality of our most critical resource?*
   e. *Why repeat the mistakes of the past? For the sake of more residential/commercial development?*
   f. *Why is the more accurate determination of the ground water flow and hydrogeology given such a low priority in the new management plan?*
   g. *Why should one group of individuals benefit at the expense of another?*

Water Quantity and Quality Mitigation Plan

The following comments pertain to items in the Principal Aquifer Water Quantity and Quality Mitigation Plan flowchart that was a handout obtained at the September 30, 2003 meeting. This flowchart is referenced in article 7.3 Proposal to the State Engineer Concerning Water Rights contained in the Proposal to the Utah State NRD Trustee and USEPA CERCLA Remedial Project Manager for a Groundwater Extraction and Treatment Remedial Project in the Southwestern Jordan Valley.

Article 7.3 states;

" KUCC is committed to assist property owners affected by KUCC remediation efforts in obtaining an adequate water supply by identifying alternative water sources, providing technical assistance in siting and completion of supply wells, and providing supplemental financing in cases where the presence of contamination causes an additional cost burden to the property owner."

The potential remedies, listed in the flowchart plan, are as follows:

1. Reduced pumping
2. Deepen affected well
3. Connect well to municipal water system

Comments to Letter 03-66 (cont)

66-36 Responses provided by subsection in letter:

4a. The Consent Decree requires remediation over a 40-year period. It is likely that the groundwater extraction will continue past the 40 years. The Zone A area is in pilot stage at this time. It is scheduled to operate through 2044,assuming the project receives approval this year. Zone B is scheduled to be online sometime between 2007 and 2009, again, assuming the project receives approval this year, and will continue to operate for at least forty years thereafter. Mitigation will not end when the remediation project ends. Mitigation will not end when KUCC ceases operation.

4b. Individual water rights are not taken in this process.

4c. The procedures included in the Response to Common Comment No.10, provide a mechanism for evaluating individual well owner concerns regarding water quality and quantity.

4d. Positive effects will be immediate upon full implementation because drinking water will be produced from the contaminated aquifer. Monitoring over time will show the more gradual positive effects on the groundwater quality, as the plume is confined and reduced.

4e. The agreements described in the Joint Proposal contemplate that Zone A and Zone B will be complete and operational no later than January 31, 2009, and January 31, 2010, respectively. Zone A will likely be operational in 2005, and Zone B will likely be operational in 2007, assuming the project receives approval this year. Pilot scale plants have already been completed.

66-37 Responses provided by subsection in letter; also see Response to Common Comment No. 10.

5a. The remedial work does not target negative impact for private well owners but rather focuses on containment and treatment of contaminated groundwater.

5b. As reflected in other responses, pilot studies have been conducted and the groundwater flow system has been studied. Additional information will be gained once pumping commences and the monitoring results are examined. The remedial work targets contaminants related to mining and is not designed to address other non-mining related contaminants even though the RO plants may remove other possible contaminants.

5c. All available data has been used to make sound decisions for the project.

5d. The quality of the existing Zone A and B groundwater supply is not acceptable for drinking water. If the project does not proceed, additional groundwater resources may become contaminated. The quantity and quality of groundwater have been documented in the USGS and Kennecott modeling efforts.

5e. The project is designed to contain and treat contaminated groundwater.

5a-e. The remediation project will not be implemented in a way that has potential for negative impacts for private well owners. The continued movement and expansion of the contamination plume poses a substantial danger to uncontaminated groundwater resources in Salt Lake Valley. The Consent Decree contemplates an urgent need to contain the contaminant plume from future movement and to diminish its size through remediation. Substantial studies have been performed to demonstrate how remediation can practically occur.

5f. This comment on the Salt Lake Valley Groundwater Management Plan would more appropriately be addressed to the Division of Water Rights.

5g. All of the public in the Affected Area will benefit directly or indirectly from the proposed project. Additional public water supply will be made available to the public, and groundwater contamination that threatens other groundwater resources and well owners will be contained, diminished, and substantially remediated.

Letter 03-66 (cont)

4. Injection
5. Bottled Water
6. Household Treatment

Questions and Comments

66-38 Are the potential remedies listed above, in order of preferred priority for evaluation?

Reduced pumping

66-39 *Reduced pumping must be an optional remedy for each individual private well owner.*
How much? Partial reduction/complete reduction?
Is priority date to be used to impose this regulation?
Is the remediation plan subject to this remedy? (If not they should be.)

Deepen affected well

66-40 *This is an appropriate remedy but should be based on anticipated additional drawdown levels resulting from projected future recharge and withdrawals from all possible sources including the remediation project.*

Any and all expense associated with deepening the affected well must be borne by KUCC.

Connect well to municipal water system

66-41 *This is an acceptable remedy if private well owners can choose to accept this solution based on known impacts to the quantity and quality of water and the costs involved. The quantity and rate of flow of established water rights must be maintained to the well owner through the municipal supply at no additional cost to the well owner. This remedy should apply to multiple wells if an individual owner has more than one affected well.*

Injection

66-42 *To what extent?*
How much land area, and how many wells would be involved?
The expense involved in this practice should not be passed on to individual well owners. Individual well owners are not responsible for the additional drawdown on the groundwater resource resulting from the remediation process.

Bottled Water

66-43 *Is this intended to be a permanent or temporary remedy?*
Will continued use of existing well water be approved for all other needs other than drinking?
Any expense incurred to maintain continued use of a well not suitable for human consumption should be borne by KUCC.

Household treatment

66-44 *All expense involved with installation and extended maintenance of water treatment equipment should be borne by KUCC remediation project.*

Flowchart Components:

Evaluate Use, Quality,
Quantity, Seniority,
Baseline Data, etc.
(KUCC / DWR / DWQ)

NOTE:

66-45 *The inclusion of KUCC / DWR / DWQ on the flowchart at this point conveys the message that those three entities are the only ones involved in the decision making process for all of the items in the flowchart that follow.*

Comments to Letter 03-66 (cont)

66-38 Not necessarily. Please see the Response to Common Comment No. 10 regarding how impacts to individual well owners will be resolved.

66-39 At this time, the private well owner has not been asked to reduce pumping. If the aquifer cannot sustain the pumping rates for all involved, the first priority will be to contain or reduce the spreading of contaminated water. It is possible that priority dates will be considered. If this is required, then all affected parties, including Kennecott and JVWCD, could be asked to reduce their pumping.

66-40 The expense should be borne by the party or parties that caused the need for the deepening of the well. Questions of liability are dependent on the facts, circumstances and law applicable to the matter. The Trustee cannot determine the consequences of legal liability in the hypothetical context in which this comment is raised.

66-41 The number of wells in the Affected Area that are used for culinary supply are limited, but the importance of those wells is recognized. The private well owner could likely continue to use the well for secondary use. If the municipalities develop secondary water systems, then it may be possible to work out a water dedication policy with the municipality.

66-42 This requires additional evaluation, based on the circumstances of the particular situation.

6**6-43** The aquifer cleanup is designed to be a permanent remedy. It is not possible to predict water uses through time.

66-44 See the proposed procedures included in Response to Common Comment No.10 regarding the processes for addressing well owner concerns.

66-45 The well owner would also be included in the decision making process; much of the information and data used to make the decision would likely be gathered by the entities listed.

Letter 03-66 (cont)

66-46 What event will trigger the start of this process with an individual well owner?

66-47 What data will be used to determine baseline information? Will KUCC / DWR / DWQ determine initial static water levels for all wells in the southwest valley prior to the commencement of pumping? What data sources will be used, Pre-drought (1985) measurements?

Original well records, or recent past records, or yet to be determined values from future measurement?

66-48 Baseline data from a single well can be used as a basis for evaluating the draw down effects (actual or potential or anticipated) of wells located at great distances from the individual wells. Such far-reaching effects from distant wells, however, can only be definitively determined by utilizing information about the groundwater flow system, and the hydrogeology between the wells being evaluated. This type of information is not currently available. Will KUCC / DWR /DWQ use this lack of knowledge as a means to avoid any mitigation remedy?

Accurate baseline data for individual wells cannot presently be determined due to the six years of continuous drought having negatively distorted ground water levels well into the future. Any attempt to determine baseline data for individual wells must include corrections to recent or future measurements to account for the lower levels of the aquifer due to the recent years of drought and below average precipitation. An alternative would be to utilize static water levels for wells determined prior to the years (1985) of steady decline.

The proposed mitigation plan is based on managing one individual water well baseline data at a time. This is clearly an application of the divide-and-conquer strategy. Adjustments for the effects of drought and collective evaluation of negative effects to multitudes of individual wells is the only strategy that would overcome the existing consequences of the drought and the lack of knowledge of the ground water flow system and valley hydrogeology.

Has draw down or
66-49 **Contamination caused**
Unreasonable impacts?

What type of contamination is to be considered?
What is the possible source of contamination?
What is considered unreasonable?
What are the criteria for determining what is unreasonable?
Who decides what is unreasonable?

It must be the prerogative of the well owner to decide what is unreasonable. Unreasonable interference with individual water wells should be assumed to be the result of the excessive proposed withdrawals from both the shallow and principal aquifer proposed by the Southwest Jordan Valley Ground Water Cleanup Project. KUCC and JVWCD must be required to prove that their activities have not resulted in unreasonable interference with individual wells. The burden of proof must not be placed on individual well owners.

66-50 Well owners, if they choose, should have an active role in the process of determining the source and nature of problems with their own wells. It is not the well owners who are creating the potential negative impacts to their own wells.

Notify Well Owner

The well owner will only be notified if KUCC / DWR / DWQ has determined that draw down and/or contamination **has not** caused unreasonable impacts. The well owner is relegated to being only a recipient of information regarding impacts to their water rights. The well owner is provided no other recourse for the concerns that they have submitted regarding problems with their water rights. What if the well owner disagrees with the conclusions? Will independent evaluation by a third party followed by negotiation and or mediation be provided without cost to the well owner?

The well owner should have the right to insist on an accurate identification of problems created with their wells. The lack of knowledge about the groundwater flow system and the hydrogeology of the Salt Lake Valley make it impossible for well owners to effectively argue that the problems they are experiencing are a consequence of the design and implementation of the remediation process. This lack of knowledge is working against individual well owners being able to protect their individual rights, relative to both the implementation of the ground water remediation plan and the mitigation of the negative effects to individual wells.

Comments to Letter 03-66 (cont)

66-46 Several items could trigger the process. For example, monitoring data gathered and analyzed, which may depict trends, may trigger the process. If the trend suggests that water levels or water quality will be significantly affected, then mitigation would be planned. Another trigger would be an individual well owner raising an issue regarding well performance either due to quantity or quality problems.

66-47 Well inventory information coupled with actual water level and water quality information could be used. The inventory information has already been assembled and is updated when new wells are placed. The monitoring information includes water levels and water quality information for a representative area throughout Zone A and Zone B. Static levels are derived from several locations including the initial driller's report and from the regional grid of monitoring wells. Certain private wells will also be used in the assessment of static levels. All sources will be considered. Private water wells have been drilled before and after various droughts. Time series information for the general area will be critical for all areas to assess regional trends. In addition, land use information and historical use will also be important to assess, i.e. lands that were previously used as gravity irrigation agricultural lands, may have had more infiltration of water to the groundwater. Any reliable, available data may be used.

66-48 Kennecott, JVWCD, and agencies will use knowledge and data to understand the hydrology and solve problems.

66-49 Yes. Metals and sulfate are contaminants in the acid plume. Sulfate is the focus of the groundwater cleanup throughout Zones A and B. Mining and non-mining related activities have contributed to the contamination. Contamination in Zones A and B resulted from mining sources including the Kennecott's former evaporation ponds, Bingham Creek Reservoir and the area adjacent to the waste rock piles on the southwest side of the Salt Lake Valley. The Consent Decree established sulfate concentrations greater than 500 mg/L in groundwater as unreasonable.

66-50 See the Response to Common Comment No. 10 and the Kennecott and JVWCD water quality and quantity review diagrams regarding the roles of the well owner and the well owners options. Impacts to individual well owners will be determined on a case-by-case basis.

Well owners should have an active role in the process of determining the source and nature of problems with their own wells.

Evaluate Remedies
The well owner must be allowed to be included in the process of formulating and evaluating remedies.

NOTE:
Additional Box: It is suggested that an additional box be included in the flowchart as follows:
Choose Remedies
The well owner should have the authority to select from evaluated alternatives, which remedy they would prefer to have implemented.

Review with
Well Owner,
DWR and/or
DWQ
It is not appropriate to relegate the well owner to being only a recipient of a remedy chosen by KUCC / DWR / DWQ.

Implement Remedy
(KUCC)
This box should be changed to reflect that KUCC should only fund the implementation of the remedy.
The well owner must have the control over who implements the selected remedy.
What recourse is available to well owners if the quality of the implementation of a remedy by KUCC is not acceptable or does not work either for the short or long term?
Funding the implementation of a remedy should not be arbitrarily limited or set by KUCC. An independent panel should make a determination of amounts that are acceptable for the various optional remedies. Provision should also be made for adjustments to these set amounts to deal with special and/or individual circumstances.

CONCLUSION

66-51

The language of the mitigation plan, proposed by KUCC, clearly does not attempt to protect existing water rights. To the contrary, it spells out the exploitation of existing water rights. The very process of excluding well owners from the decision making process plus the process of placing the burden of proof of unreasonable interference on the individual well owner form the foundation of this exploitation of individual rights.

This mitigation plan paves the way for lack of knowledge regarding the ground water flow system and hydrogeology of the valley and every possible reason other than draw down, to be used as excuses to explain problems with individual water wells. Excluding the effects of the current drought from the current water clean up plans, is one example of how information has been conspicuously been left out in order to be able to utilize consequences of the drought to confuse unreasonable draw-down interference evaluation for individual wells. It appears to be a deliberate strategy to avoid having to implement remedies to individual well owners.

Zone B/Lost Use Groundwater Interference Mitigation Plan

66-52

The following comments pertain to the items in a flowchart of the *Zone B/Lost Use* mitigation plan that was presented as a handout at the September 30, 2003 informational meeting. Information contained in this flowchart, or even references to it, could not be found in any of the three documents identified for public comment. The absence of reference to any JVWCD mitigation plan in the three documents dealing with the Southwest Jordan Valley ground Water Cleanup Project, indicates JVWCD has not prepared any legal written responsibility to carry out a mitigation plan dealing with negative impacts to individuals water rights. JVWCD must have a written commitment to follow through with a ground water interference mitigation plan. In the absence of any reference to a Zone B/Lost Use mitigation plan in the three documents identified for public comment, we make our comments based on the assumption that the flow chart handed out for public information constitutes a JVWCD official Zone B/Lost Use mitigation plan.

66-51 See the Responses to Common Comments Nos. 2 and 10.

66-52 The chart entitled "Zone B/Lost Use Groundwater Interference Mitigation Plan" was not submitted by JVWCD as an official part of the Joint Proposal. It constitutes the procedures provided under Utah water rights law for potential groundwater interference. JVWCD does not intend to create new obligations, programs or a mitigation plan. Instead, existing water rights law will prevail, as stated by the 1995 Consent Decree.

Letter 03-66 (cont)

The potential remedies, listed in the flowchart plan, are as follows:

1. Reduced pumping
2. Deepen affected well
3. Connect well owner to municipal water system
4. Compensation

Questions and Comments

66-53 Are the potential remedies listed above, in order of preferred priority for evaluation?

Reduced pumping
Reduced pumping must be an optional remedy for each individual private well owner.
How much? Partial reduction/complete reduction?
Is priority date to be used to impose this regulation?
Is the remediation plan subject to this remedy? (If not they should be.)

Deepen affected well
This is an appropriate remedy but should be based on anticipated additional drawdown levels resulting from projected future recharge and withdrawals from all possible sources including the remediation project.

Any and all expense associated with deepening the affected well must be borne by JVWCD.

Connect well owner to municipal water system
This is an acceptable remedy if private well owners can choose to accept this solution based on known impacts to the quantity and quality of water and the costs involved. The quantity and rate of flow of established water rights must be maintained in the municipal supply at no additional cost to the well owner. This remedy should apply to multiple wells if an individual owner has more than one affected well.

Compensation
Individual well owners must have the right to determine the amount of damage resulting from the loss of their water resource. Factors such as amount of water flow and total volume, devaluation of existing property, replacement expense, amount of land area affected, number of wells involved, and other appropriate losses should be considered in determining the level of compensation.
Any expense involved by well owners in procuring professional assistance in determining the amount of loss should be covered by JVWCD. Individual well owners are not responsible for the additional draw-down on the groundwater resource resulting from the remediation process.

Flowchart Components:

Evaluate Draw Down Impact and SL Valley Groundwater Management Plan (JVWCD, DWR)

NOTE:
The inclusion of JVWCD, DWR on the flowchart at this point conveys the message that those two entities are the only ones involved in the decision making process for all of the items in the flowchart that follow.

66-54 What event will trigger the start of this process for an individual well owner?

66-55 What data will be used to determine drawdown impacts? Will JVWCD determine initial static water levels for all wells in the southwest valley prior to the commencement of pumping? What data sources will be used, Pre-drought (1985) measurements?
Original well records, or recent past records, or yet to be determined values from future measurement?

Comments to Letter 03-66 (cont)

66-53 The potential remedies are not listed by preferred priority. See the Response to Common Comment No. 10. Details of any remedy would be determined on a case-by-case basis.

66-54 An event that would trigger the start of this process would be the receipt of a complaint by JVWCD from a well owner. JVWCD would evaluate existing data, and would consider and discuss with the well owner draw down measurements between the potentially affected well and the operation of the project well or wells of JVWCD.

66-55 It is likely that "baseline data" would not be necessary. This is because the regional groundwater levels respond to various influences, such as multiple year wet and dry cycles, as well as the regional influence of dozens to hundreds of existing wells pumping in the area. Instead, the specific draw down impact upon any single potentially affected well would be measured, if necessary.

Letter 03-66 (cont)

66-56

Baseline data from a single well can be used as a basis for evaluating the draw down effects (actual or potential or anticipated) of wells located at great distances from the individual wells. Such far-reaching effects from distant wells, however, can only be definitively determined by utilizing information about the groundwater flow system, and the hydrogeology between the wells being evaluated. This type of information is not currently available. Will JVWCD and DWR use this lack of knowledge as a means to avoid any mitigation remedy?

Accurate baseline data for individual wells cannot presently be determined due to the six years of continuous drought having negatively distorted ground water levels well into the future. Any attempt to determine baseline data for individual wells must include corrections to recent or future measurements to account for the lower levels of the aquifer due to the recent years of drought and below average precipitation. An alternative would be to utilize static water levels for wells determined prior to the years (1985) of steady decline.

The proposed mitigation plan is based on managing one individual water well baseline data at a time. This is clearly an application of the divide-and-conquer strategy. Adjustments for the effects of drought and collective evaluation of negative effects to multitudes of individual wells is the only strategy that would overcome the existing consequences of the drought and the lack of knowledge of the ground water flow system and valley hydrogeology.

66-57

Has draw down
Created Unreasonable interference,
and is it caused by one or
more Zone B or lost use wells?

What is considered unreasonable? (Will both Quantity and Quality issues be considered?)
Who decides what is unreasonable?
What are the criteria for determining what is unreasonable?
Who decides what the criteria are for determining what is unreasonable?

It must be the prerogative of the well owner to decide what is unreasonable interference. Unreasonable interference with individual water wells should be assumed to be the result of the excessive proposed withdrawals from both the shallow and principal aquifer proposed by the Southwest Jordan Valley Ground Water Cleanup Project. KUCC and JVWCD must be required to prove that their activities have not resulted in unreasonable interference with individual wells. The burden of proof must not be placed on individual well owners.

Well owners, if they choose, should have an active role in the process of determining the source and nature of problems with their own wells. It is not the well owners who are creating the potential negative impacts to their own wells.

If Zone B wells and Lost Use wells are operating at the same time will it be possible to separate which wells are causing unreasonable interference?

JVWCD Notifies Well Owner and DWR

The well owner will be notified if JVWCD has unilaterally determined that draw down and/or contamination has not caused unreasonable impacts. The well owner is relegated to being only a recipient of information regarding impacts to their water rights. The well owner is provided no other recourse for the concerns that they have submitted regarding problems with their water rights. What if the well owner disagrees with the conclusions? Will independent evaluation by a third party followed by negotiation and or mediation be provided without cost to the well owner?

The well owner should have the right to insist on an accurate identification of problems created with their wells. The lack of knowledge about the groundwater flow system and the hydrogeology of the Salt Lake Valley make it impossible for well owners to effectively argue that the problems they are experiencing are a consequence of the design and implementation of the remediation process. This lack of knowledge is working against individual well owners being able to protect their individual rights, relative to both in the implementation of the ground water remediation plan and the mitigation of the negative effects to individual wells.

Well owners should have an active role in the process of determining the source and nature of problems with their own wells.

Comments to Letter 03-66 (cont)

66-56 Knowledge and data will be used to understand the hydrology and solve problems. Details of any remedy would be determined on a case-by-case basis.

66-57 "Unreasonable interference" is defined by the State Engineer in the Salt Lake Valley Groundwater Management Plan to be 12 feet. The details of methods of measuring potential interference on a well would be discussed between JVWCD and the potentially affected well owner, and selected for any specified case. Decisions on remedies will be made in accordance with the law and on a case-by-case basis. Also see the Response to Common Comment No.10.

Letter 03-66 (cont)

JVWCD
It is assumed that this box in the flow chart means that JVWCD will formulate a single remedy totally without input from any other source.
The well owner must be allowed to be included in the process of formulating and evaluating remedies.

NOTE:
Additional Box: It is suggested that an additional box be included in the flowchart as follows:
Choose Remedies
The well owner should have the authority to select from evaluated alternatives, which remedy they would prefer to have implemented.

Review remedy with
Well Owner and DWR
(JVWCD)
It is not appropriate to relegate the well owner to being only a recipient of a remedy chosen by JVWCD.

Implement Remedy
(JVWCD)
This box should be changed to reflect that JVWCD should only fund the implementation of the remedy.
The well owner must have the control over who implements the selected remedy.
What recourse is available to well owners if the quality of the implementation of a remedy by JVWCD is not acceptable or does not work either for the short or long term?
Funding the implementation of a remedy should not be arbitrarily limited or set by JVWCD. An independent panel should make a determination of amounts that are acceptable for the various optional remedies. Provision should also be made for adjustments to these set amounts to deal with special and/or individual circumstances.

CONCLUSION
The language of the mitigation plan, proposed by JVWCD, clearly does not attempt to protect existing water rights. To the contrary, it spells out the exploitation of existing water rights. The very process of excluding well owners from the decision making process plus the process of placing the burden of proof of unreasonable interference on the individual well owner form the foundation of this exploitation of individual rights.

66-58 This Zone B/Lost Use mitigation plan paves the way for lack of knowledge regarding the ground water flow system and hydrogeology of the valley and every possible reason other than draw down, to be used as excuses to explain problems with individual water wells. Excluding the effects of the current drought from the proposed water clean up plan, is one example of how information has been conspicuously been left out in order to be able to utilize consequences of the drought to confuse unreasonable draw-down interference evaluation for individual wells. It appears to be a deliberate strategy to avoid having to implement remedies to individual well owners.

The following items have been taken from the document <u>Proposal to the Utah State NRD Trustee and USEPA CERCLA Remedial Project Manager for a Groundwater Extraction and Treatment Remedial Project in the Southwestern Jordan Valley</u>. The numbered items are from text found in the source document. The bulleted items are our comments and/or questions relative to the numbered items.

1. Section 2.1- In August 1995, the District Court approved and entered the final NRD Consent Decree.

66-59 ➢ *All negotiations, planning, analysis, and final agreements, in the Consent Decree related to the remedial project took place prior to the continuous period of drought that has existed since 1998. The effects of the past years of the drought and the possible continuation of more years of drought raise serious questions regarding the wisdom of implementing the remediation project as originally proposed. The implementation should be scaled back to levels that are realistic with current conditions. Perhaps the Consent Decree should also be revised to reflect the current and possible additional effects of drought.*

Comments to Letter 03-66 (cont)

66-58 The mitigation plan acknowledges the current process provided by law for dealing with potential unreasonable interference.

66-59 For the Zone A area, containment and removal of the poor quality groundwater becomes critical to prevent spread of contamination. Containment of Zone B sulfate contamination is also necessary to reduce the impact to the aquifer. Kennecott, JVWCD, and the TRC will monitor the aquifer cleanup and make changes as needed during the 40-year period to maximize removal of contaminants while sustaining the aquifer.

The Consent Decree was entered by the District Court and does not need to be revised. The Consent Decree appropriately contemplates proceeding with the priority task of containing and remediating the contaminant plume.

Letter 03-66 (cont)

66-60

2. Section 3.3- Better met the needs of growing communities in the Zone A area (described in section 4 below) by providing treated water at a high elevation that allows for westward land development.

   - *Elimination of the contaminated ground water plume is a goal that is in the public interest. Combining this goal with the goal of providing for westward land development is not required by the Consent Decree. Extracting amounts of water from the principal aquifer beyond what is actually being replenished from natural sources, for the purpose of land development, is not in the public interest.*

66-61

3. Section 2.3- It (conceptual design) also provides for additional replacement of water beyond that contemplated by the Consent Decree, including the 1,235 afy of water otherwise lost in the treatment process. Section 5.4 - The lower range corresponds to the minimum treated water annual volume of 1,235 acre-feet, as required by the Consent Decree to offset lost use of concentrate.

   - *These two statements are contradictory. The lost use portion is not required by the Consent Decree.*

66-62

4. Section 6.2 – Groundwater elevations declined substantially throughout the southwestern Jordan Valley from 1986 to 1996. A noteworthy area of decline is in the region of the West Jordan City well field, to the north of the Affected Area. A description of recent groundwater elevation changes used in the modeling is included in Appendix A.

The following items have been taken from Appendix A of the document Proposal to the Utah State NRD Trustee and USEPA CERCLA Remedial Project Manager for a Groundwater Extraction and Treatment Remedial Project in the Southwestern Jordan Valley. The numbered items are from text found in the source document. The bulleted items are our comments and/or questions relative to the numbered items.

66-63

1. **Groundwater Extraction.** From 1990-1996 West Jordan City, Riverton City, and Kennecott had a combined extraction rate of 14,712 acre-feet per year from the principal aquifer of the southwest part of the valley.

   - *No information is provided regarding extraction rates from 1997-2003. Based on increases in population in this area of the SL valley we would assume the extraction rates have increased during the 1997-2003 time frame.*

2. **Groundwater Elevation Changes.** Groundwater elevations declined substantially throughout the SWJV from 1986 to 1996. The largest declines have occurred in the West Jordan City well field area (81 feet) and near KUCC process water wells (72 feet). The rate of decline in this area has averaged 4-8 ft/yr. The rate of decline increased substantially during 1991-1996 due to increased pumping by West Jordan City.

   Water-level declines along the eastern boundary of the KUCC waste rock piles have averaged 0.7 ft/yr since 1986. This decline is more likely due to several years of below-average precipitation during the late 1980s and early 1990s.

   The overall average rate of water level decline for the SWJV was approximately 2.4 ft/yr from 1986 to 1996. **The continued decline of groundwater elevations, and the relatively rapid increase in decline in recent years, indicates that more groundwater is being removed from the principal aquifer than is currently supplied from natural recharge.**

66-64

   - *In the seven (7) years from 1996-2003 natural recharge of the principal aquifer has been dramatically less than during the period from 1986-1996!*
   - *What is the average rate of decline of the water level in the principal aquifer over the last seven years?*
   - *How long can withdrawals that exceed the natural rate of recharge be allowed to continue?*

Comments to Letter 03-66 (cont)

66-60 The Trustee acknowledges that members of the public could disagree over whether westward land development is in the public interest, and that this is not a criterion for a decision under the Consent Decree.

66-61 The Consent Decree provides that the quantity of the injured ground water resource was 8,235 acre-feet per year. The damages in the Consent Decree were calculated based upon this amount of water. An 85% net output from the treatment plant was assumed, for a total of 7,000 acre-feet of water from Zones A and B as provided in the Consent Decree. The amount of the irrevocable letter of credit was calculated based on 7,000 acre-feet. The remaining 1,235 acre-feet represents the 15% estimated to be lost in the waste stream during the treatment process. A portion of the cash settlement placed in the Trust Fund represents compensation to the State for the water lost in the waste stream. Under the project outlined by the Joint Proposal, JVWCD seeks to utilize a portion of the cash in the Trust Fund in order to deliver the 1,235 acre-feet of water that was estimated to be lost in the waste stream under the provisions of the Consent Decree Sections V.D.1 and 4.

66-62 Comment Noted.

66-63 Actual extraction rates, on average, are less than for the period of 1990-1996 due to the import of JVWCD water from the Wasatch and Uintah Mountain areas.

66-64 In the Zone A area, the rate of decline has been 0 to 4 feet per year and in Zone B the rate of decline monitored has been 0 to 2 feet per year.
The recent declines in groundwater levels of the principal aquifer are part of a longer-term pattern of rising and falling levels in response to wetter and drier periods. For example, long-term water level monitoring records maintained by the US Geological Survey and the Utah Divisions of Water Rights and Water Resources show these cycles of higher and lower groundwater levels with wet and dry periods of years for 1965-2002 (*Ground-Water Conditions in Utah, Spring of 2002*, Cooperative Investigations Report No. 43). Groundwater levels in most of Zone A and B areas are higher now than they were in 1963 (*Ground-Water Conditions in Utah, Spring of 1993*, Cooperative Investigations Report No. 33).
Recent declines in groundwater levels in Zones A and B do not necessarily indicate that water is being withdrawn faster than it is being naturally recharged. Groundwater studies and modeling indicate that there is more natural recharge than well withdrawals in the Affected Area (*Revised Flow and Transport Model, Southwestern Jordan Valley, Utah*, Addendum to the Joint Proposal). Groundwater modeling also indicates that this would still be true after implementation of the proposed project. Zone A withdrawals would not be new withdrawals on the aquifer, but have been made by Kennecott over the last 30-40 years.
The State Engineer has issued the Final Salt Lake Valley Groundwater Management Plan. This plan places limits on groundwater withdrawals within specified management areas of Salt Lake Valley. These limits are for safe yield quantities that the State Engineer has determined. His authority to administer and limit water withdrawals based on water right priority dates, together with the Salt Lake Valley Groundwater Management Plan, provides safeguards against groundwater mining.

Letter 03-66 (cont)

- *Has such a thing as a critical maximum allowable depth from the ground surface to the potentiometric surface of the principal aquifer ever been considered? How much decline in the level of the principal aquifer can be tolerated before corrective actions are initiated? What would these corrective actions be? Municipal wells are being drilled to depths of over 1000 feet. Is 1000+ feet an indication of how far declines in the water level will be allowed to go? What would be the consequences of having water levels of the principal aquifer 1000+ feet below the ground surface?*
- *Water level declines of the principal aquifer cannot be allowed to continue forever.*
- *The water resource of the principal aquifer should be managed in a manner that maintains water levels of the aquifer within an acceptable range that will protect the water rights of everyone? This is the stated goal of the new Salt Lake Valley Groundwater Management Plan.*
- *Implementing the KUCC/JVWCD proposed water clean up plan would result in the withdrawal of an additional 7000 acre-feet per year from the principal aquifer and an additional 1235 acre-feet per year from the shallow aquifer beyond the amounts already being withdrawn, by KUCC and municipalities, from the rapidly declining principal aquifer. If more water was already being withdrawn than was being replenished from natural recharge prior to the last five (5) years of drought, where does everyone suppose this proposed, additional 8,235 acre-feet per year of water, will come from?*
- *Under the current conditions providing a sustainable supply of 7000 afy for the next 40-50 years would appear to be very unlikely.*

The following items have been taken from Appendix D of the document *Proposal to the Utah State NRD Trustee and USEPA CERCLA Remedial Project Manager for a Groundwater Extraction and Treatment Remedial Project in the Southwestern Jordan Valley*. The numbered items are from text found in the source document. The bulleted items are our comments and/or questions relative to the numbered items.

66-65

1. The revised flow and transport model incorporates recharge to the principal and shallow unconfined aquifers from the following sources:
   Precipitation
   Bedrock aquifer
   Irrigation canals
   Irrigated fields, lawns, and gardens
   Stream and channel fill
   Reservoirs, and evaporation ponds
   Discharge sources include extraction from wells, evapotranspiration, and head dependent boundaries. The steady-state simulated hydrologic conditions in 1965. The transient-state simulated the period 1966-1998 and included annual stress periods.
   - *There was no modeling of conditions during the draught from 1998 until the present.*
   - *What about modeling based on continuation of draught conditions into the future?*

66-66

2. The revised model was calibrated for steady-state and transient-state conditions in the same manner as the original model due to a shortage of data describing the steady-state condition of the aquifer.
   - *What is the level of uncertainty in the model calibration that can be attributed to the shortage of data on the steady-state of the aquifer?*
   - *When has the principal aquifer ever been in a steady-state condition? Prior to any use of the ground water resource? Why were 1965 conditions selected?*

66-67

3. Irrigation and lawn watering seepage, irrigation canal seepage, and river boundary parameters, were not used as steady-stat calibration variables. Data were not available within the study area for the water table within the shallow unconfined aquifer. The shallow unconfined aquifer could only be analyzed by evaluating the ground water contribution to the Jordan River.
   - *How will the exclusion of surface variables and lack of data regarding the water table of the shallow aquifer make it possible for this model to include analysis of potential groundwater contamination infiltration from the shallow aquifer?*

Comments to Letter 03-66 (cont)

66-65 The most recent transient calibration included using calibration target data as recent as 2001. Upgrades to the current model are ongoing and variables to the aerial recharge component are being reevaluated. Water level declines post 1996 were part of these new targets and will continue to be assessed as new data becomes available.

Upgrades to the current model are ongoing and variables to the aerial recharge component are being reevaluated. As part of Kennecott's ongoing effort, the model is continually undergoing upgrades consistent with changing regional data. This will allow for simulation results based on ranges of possible values (as in the case of uncertainty in future aerial recharge possibilities) and being able to assess multiple scenarios based on these ranges.

66-66 Best available knowledge and estimates from Lambert (1995) and Hely, Mower and Harr (1971) were used as reference by Kennecott in its determinations and assumptions for this endeavor. Kennecott pump tests and other exercises as per the Remedial Investigation provided some additional knowledge beyond that previously available via USGS and other resources. However, the scope of work was such that deference to the aforementioned sources and knowledge base was necessary. As to the quantification of the level of uncertainty in the model calibration that can be attributed to the shortage of data on the steady state of the aquifer, such a determination would be quite difficult to quantify.

Kennecott used 1965 for its steady-state condition as it was determined to be the best available condition based on results of the best previous works by Lambert, from which he derived his conceptual model approach, and assumptions from previous work done by Hely, Mower and Harr and publications of the United States Geological Survey. In essence, by around 1968, it was viewed that there was finally enough data gathered to make an estimate at a potentiometric surface and it was determined that the greater Salt Lake basin as a whole was as close to a steady state condition as would be possible given the circumstances with respect to historical and available data.

66-67 The unconfined aquifer was modeled as per best available field data tests conducted by Kennecott and others. As such, the model was constructed to simulate upward hydraulic gradients for the greater unconfined aquifer. Hydrogeologically speaking, it is believed that impact due to contamination from the unconfined to the confined aquifer would be an exception, and not the rule, which is why these gradients were modeled accordingly with regard to the unconfined region.

Letter 03-66 (cont)

66-68

4. The transient-state relied predominately on matching the observed water level changes that have occurred within the SWJV from 1965 to 1998 with the original modeling results. Extreme water-level declines have occurred within the modeled area due to excessive pumping of ground water for municipal and industrial needs.
   - *Despite extreme water level declines from past excessive pumping, the transient-state calibration has not included any of the effects of the draught conditions that have existed from 1998 to 2003.*

66-69

66-70

5. Classifications of previous sensitivity analyses from the original model were followed in the revised model. The classifications for both models showed that model parameters fit into three groups; sensitive, moderately sensitive, and insensitive. Model parameters identified as sensitive included areal recharge, bedrock recharge, and the horizontal hydraulic conductivity representing the principal aquifer. Increasing or decreasing the magnitude of the parameters termed as sensitive caused the model to produce erroneous results. The model responded by over- or under-predicting the water-level elevation or computing unacceptable discharge values to the Jordan River. Model parameters termed as insensitive included riverbed conductance, horizontal hydraulic conductivity of the shallow unconfined aquifer, and vertical hydraulic conductivity of the shallow unconfined aquifer. When modifications were made to these insensitive parameters, computed results did not deviate from the observed conditions.
   - *Mother nature will undoubtedly impose increases and decreases to the magnitude of the aerial recharge, and bedrock recharge parameters. These natural changes will not result in out of range water level elevations in the principal aquifer and unacceptable values of discharge to the Jordan River.*
   - *The erroneous results produced by the revised model from changes to the values of areal recharge, bedrock recharge, and horizontal hydraulic connectivity seem to provide evidence that the revised model does not satisfy the conditions of item 3.0 # 4 c of the State Water Management Plan?*
   - *The fact that changes to the parameters for the shallow unconfined aquifer did not deviate from the observed conditions would indicate that conditions in the principal aquifer are not affected by conditions in the shallow aquifer. This conclusion is inconsistent with previous research that shows there is a significant potential for impact to the principal aquifer from conditions in the shallow aquifer.*

66-71

66-72

6. Overall, the revised KUCC model shows improvements over the original model. The model closely simulated observed water level declines, estimated discharge of the Jordan River, computed flows to the northern boundary, and vertical hydraulic gradient through the modeled area. It is therefore considered to be an improved tool for predicting flow, and containment transport for the Jordan Valley.
   - *The revised model was limited to a demonstration that the extraction wells would reduce the level of contaminants in the principal aquifer while preventing the additional spread of the ground water contaminants. The revised model did not include any capability to determine the potential contamination of the principal aquifer resulting from the implementation of the water clean-up plan. Possible transmission of contaminants into the principal aquifer from the shallow aquifer, as a result of drawdown resulting from operation of the extraction wells, was not included in the modeling process.*
   - *It would be a much better circumstance to be able to say that the revised model could be an accurate tool rather than an improved tool for predicting flow and containment transport for the Jordan Valley. More data and additional research are needed to improve the performance of the modeling process.*

CONCLUSION

Our evaluation of the documentation for the proposed Southwest Jordan Valley Cleanup Project has made it clear to us that we are at a critical juncture relative to the wise management and use of our precious water resources while attempting to protect individual water rights. Protecting the Salt Lake Valley water resource and individual water rights for the near and distant future requires that good decisions be made now and that

Comments to Letter 03-66 (cont)

66-68 Again, upgrades to the current model are ongoing and variables such as aerial recharge are continually reevaluated. The most recent transient calibration included using target data as recent as 2001 and water level declines were included as part of this process. As part of Kennecott's continued effort, the model is continually undergoing upgrades consistent with changing regional data. Future simulation results with regard to recharge will be investigated via ranges of possible values resulting in being able to assess multiple scenarios.

66-69 It appears that the question is in regards to the Salt Lake Valley Ground-Water Management Plan--Final Draft, April 9, 2001. Because no Item 3.0#4c could be found in that plan, it is assumed the commenter is referring to 2.3 #4c of the plan. Item 2.3#4c states: "Additional ground-water withdrawals will not significantly reduce water levels, degrade the water quality, or otherwise negatively impact the aquifer". The project outlined by the Joint Proposal will reduce water levels in some areas. Under Item 2.2.4 of the Final Draft of the management plan, Kennecott is allowed to remove contamination associated with mining. Kennecott has committed to assist affected water users. Based upon Item 2.2.4, the Salt Lake Valley Ground-Water Management Plan does allow Kennecott to remove the affected water and assist in the mitigation of those well owners that may be affected.

66-70 The unconfined aquifer was modeled as per best available field data tests conducted by Kennecott and best available data as per previously cited works. Again, as such, the model was constructed to simulate upward hydraulic gradients for the greater unconfined aquifer. Hydrogeologically speaking, it is believed that impact due to contamination from the unconfined to the confined aquifer would be an exception and not the rule.

66-71 Although the primary goal of the modeling effort is focused around the Bingham Creek remedial effort, attention was paid to a great many aspects of the regional model, and effort was taken to assess and incorporate as accurate a representation of the hydrogeology into the Kennecott model, particularly with regard to USGS and other accepted data, as possible. The effects of the remedial plan and impacts to the surrounding environment will continue to be of interest with respect to the modeling process, and will continue to be a part of the evolving evaluation process.

66-72 Additional research will not necessarily provide a better model but additional data inputs, as the data become available, will assure best results and the most accurate representation. This is common practice with models and based upon sound science.

Letter 03-66 (cont)

diligence be maintained in watching over the water resources. The proposed water cleanup project has brought us to the point where we must put forth our best effort at making a good decision. Making a good decision can only be accomplished if we are well informed. The complexity of the issues involved with the proposed cleanup project make this a difficult challenge. In our opinion, what is required to make a good decision is knowledge and understanding. We must have knowledge of where we are now relative to water quantity and quality issues. We must also have knowledge of what our options are for dealing with current and future anticipated problems. We must have understanding of where we will likely be in the future based on our decisions and choices relative to our current options.

The following is our assessment of the circumstance and conflicts associated with:
WHERE WE ARE NOW with water issues.
Water Quality - Contaminant removal is in conflict with contaminant sources.
Water Quantity - Actual water resource is in conflict with allocated water resource. In our current situation we are faced with the conflicts between an inadequate water resource and an over-allocation of that resource.
WHERE WE ARE NOW with options.
Our current Salt Lake Groundwater Management Plan is attempting to minimize conflicts placed against it by competing demands for the available water resources.

Full implementation of an inadequate RO technology for contaminant removal for a 40-50 year span conflicts with a possible partial scaled down implementation of RO technology with built-in efficiency increases and capacity expansion, or a totally different and less polluting alternative.

Increasing our knowledge of the ground water flow system and hydrogeology of the Salt Lake Valley prior to implementing major water cleanup projects is in conflict with efforts to implement major projects while maintaining the current lack of knowledge about our valley water resource.

The following are our opinions formed as a result of our study and involvement with the proposed water cleanup proposal.

66-73 Have we all been lulled into a belief that our present lack of water resources, to met current levels of demand, will be resolved by more precipitation in the future? We will likely see periods of both increased supply as well as diminished supply. As our demands for water grow how will we cope with future periods of diminished supply? Our current circumstance is very serious and there are no guarantees it will end in the near future.

We are faced with a plan for clean up that crates many unanswered questions regarding individual water rights, the future integrity of our water resources, and how conflicts created by implementing the proposed cleanup project will ever be resolved. The proposed plan calls for both immediate and future large-scale water extractions from both the shallow and principal aquifers in spite of the fact that demands for water resources over the past thirteen years have already exceeded the amount available from natural supply. The cleanup plan is tied to a massive proposal for increased residential development on the land owned by KUCC (Rio Tinto). Implementing their proposed water clean up plan is necessary for this land development to take place. The stakes are very high and the motivation for deception is very significant.

66-74 How can more demand for water resources from large-scale development be met when the current demands far exceed the available resource? This concern must be considered very serious due to the fact that KUCC, JVWCD appear to have deliberately under stated this problem by omitting the effects of the last five years of drought and the resulting additional decline of the aquifer resource. We don't know how bad off we really are due to this omission of data. Is this omission deliberate? The possible negative impacts from continued periods of drought were not even mentioned in the documentation, let alone analyzed or even estimated. It is evident that KUCC (Rio Tinto) does not want anything to interfere with implementation of the clean-up plan especially the fact that the necessary water resources required by their 40-50 year project appear not to exist even for the first year of implementation.

66-75 There should be limited utilization of RO technology at the start of the clean-up project if that is the best technology available to get the plume contamination removal process started. Target dates should be set for the conversion to new and approved contaminant removal technology. Incentives for more rapid

Comments to Letter 03-66 (cont)

66-73 Drought and wet cycles have occurred and will occur in the future. The Salt Lake Valley Groundwater Management Plan provides a means for the State Engineer to deal with these issues.

66-74 the Salt Lake Valley Groundwater Management Planthe balance of supply and demand. Implementation of the proposed project is not necessary for land development by KUCC or Rio Tinto.

66-75 In approving a treatment approach, the State Trustee for Natural Resource Damages has to be assured that the method will be effective and efficient at treating the sulfate contaminated water and providing a sustainable source of municipal quality water. The use of reverse osmosis technology to treat the sulfate-contaminated water has been well documented and demonstrated to be a reliable method of water treatment. As the project moves forward, the process of extraction, treatment and provision of municipal quality water from the contaminant plumes will be optimized at times to assure that the contaminants in the aquifer are being removed in the shortest time frame possible. Kennecott and JVWCD may evaluate future technologies and make revisions as appropriate.

Letter 03-66 (cont)

implementation of improved technology should be part of the project design. Penalties for not meeting the target dates should also be part of the project design.

66-76 Having more knowledge about water quality and quantity issues increases our ability to: a) project future levels of water supply and demand, b) understand the limitations of our water resource and c) make wise decisions about levels of new development that can be realistically sustained.

Gaining more accurate knowledge of the groundwater flow system and the hydrogeology of the Salt Lake Valley is essential to the preparation of a clean-up plan that will protect the public interest and the groundwater resource. This should be a mandatory goal to be achieved prior to the preparation and implementation of any ground water clean-up project.

66-77 Implementation of cleanup projects founded on less public knowledge of the water resources puts the public at risk of having our water resources exploited through cleanup projects motivated by plans for land development profits. It provides avenues for avoiding the implementation of remedies for undesirable interference to private wells. Elimination of private wells eliminates water rights for individuals, resulting in the corporate control of all water rights. This is contrary to the goal of the Salt Lake Valley Groundwater Management Plan.

66-78 Any positive remedy proposed for an individual water well in an environment of steadily declining aquifer water levels will not be a permanent solution unless the individual well is drilled deeper than the remediation project extraction wells. Any depth less than that of the extraction wells will eventually require additional drilling or abandonment when the water level in the well goes below an acceptable depth for the equipment and configuration of the established well.

66-79 The language of the mitigation plan, proposed by KUCC, clearly does not attempt to protect existing water rights. To the contrary, it spells out the exploitation of existing water rights. The very process of implementation of the cleanup plan followed by monitoring, followed by plan modification seeks to take advantage of the lack of knowledge of the ground water flow system and hydrogeology.

66-80 **Maintaining a lack of knowledge about the ground water flow system and hydrogeology of the Salt Lake Valley appears to be a desirable goal for those associated with the current proposed water clean-up plan.** Failure to address potential long-term negative impacts to the ground water resource paves the way for the long-term operation of the remediation plan to manifest problems for individual wells that could not be determined at the beginning of the mitigation remedy because of the current lack of knowledge about the ground water resource.

66-81 The amount of money for the clean-up project negotiated in the consent decree is only about half the amount that should have been required of KUCC. There has been no research and development component included in the proposed clean-up plan. The 40 to 50 year span of the clean-up project is based on the utilization of current reverse osmosis technology. There are no built in incentives for the incorporation or development of improved technology. Much of the documentation for the proposed clean-up project deals with issues related to the operation of reverse osmosis facilities over the entire proposed 40 to 50 year span of the project. It is absurd to utilize technology that is only 70% efficient for a period of 40-50 years. Following the current proposed plan will result in our going through the next 40-50 years using 30% of our water resource to convey contaminates into the Jordan River and the Great Salt Lake. Will the contamination process ever end?

66-82 All potential sources of contamination must be added to the modeling process. Continuation of draught conditions must also be added to the modeling process. More information is needed prior to implementation of the water clean-up project.

Comments to Letter 03-66 (cont)

66-76 During the remedial investigation under CERCLA, Kennecott, with oversight from the Technical Review Committee (TRC), develop a numerical simulation of ground water flow in the Southwestern Jordan Valley, Utah (Appendix G of the Remedial Investigation Report, March 1998). As stated in Section 0.0 Executive Summary, the ground water model allowed Kennecott to analyze flow paths and ground water velocities and evaluate remedial options for the Remedial Investigation/Feasibility Study (RI/FS). The study further investigated the migration of storm and mine waste waters which leaked from the former Bingham Creek Reservoir, by coupling the ground water flow solution with a contaminate transport code (MT3D). The results of this study were presented to the TRC during 1997-1998, culminating in a final report accepted by EPA and the Utah Department of Environmental Quality (DEQ).

It is noted generally that ground water flows west to east, from the Oquirrh Mountain front to the Jordan River. Localized deviations of this flow pattern generally are caused by extraction programs (i.e., municipal well fields), which can change the direction of flow by creating localized elevation changes, which effect the hydraulic gradient of the localized aquifer. It is reported that the average horizontal ground water velocity is about 550 feet per year.

Since this initial report, Kennecott has revised this numerical simulation as part of additional studies related to the RI/FS. As reported in Appendix D of the NRD Proposal, the optimization of the model has included continuous updates of the model parameters and data in order to allow Kennecott to more accurately analyze ground water flow and contaminant migration. Some of the improvements represented in the current model presented in Appendix D include the incorporation of a head-dependent boundary along the western edge of the model that replaced the constant flux boundary used in the original model. The eastern model boundary was expanded from the Jordan River east to the base of the Wasatch Mountains. The current modeling predictions are presented in Section 3.0 Current Modeling Results, Appendix D of the NRD Proposal. Results of the modeling are also discussed briefly in Appendix A of the NRD Proposal.

The TRC is comprised of Federal, State and local regulators and policy makers, academic specialists, and community representatives. As part of reviewing and approving the model and the modeling runs, the United States Geologic Survey, Utah State Engineer's office, Division of Water Quality – Ground Water Protection Program, and other specialists reviewed the parameters and results and generally agreed with the findings. The coupling of the model with a contaminate migration code has allowed Kennecott to predict its ability to provide containment and prevent the migration of the plume, through reduction of the mass of contaminates (this information is discussed in the NRD Proposal Section 6.3 and in Appendix D).

It is noted that models are only as good as the information that is input to the model. Kennecott has agreed to present modeling information each year during the annual review of project activities and will continue to collect modeling information throughout the year to best optimize the extraction, containment and reduction of contaminated water in the Affected Area. The annual reports will be posted on the DEQ website for public review.

Letter 03-66 (cont)

66-83 There have been virtually no restrictions placed on what may be done with any water resources intended for use in the southwest area that would protect existing water rights. To the contrary regulations have been enacted that provide favored status for the remediation plan at the possible expense of the principal aquifer, existing water rights, environmental quality, and wildlife habitat.

66-84 The southwest remediation area has been identified as a contaminated area but not included as a restricted area along with the Vitro Tailings and Sharon Steel areas. The fact that no restrictions have been placed on the contaminated southwest remediation area is inconsistent with the imposition of restrictions that have been placed on the contaminated Vitro Tailings, and Sharon Steel areas. How will this inconsistent treatment of known contaminated areas be reconciled with the Midvale City proposed residential development in the Sharon Steel area?

66-85 The lack of current information, regarding water quality in the shallow aquifer and its potential impact on the deep-water aquifer, combined with the availability of new technology for an analysis of data, demand that further research be integrated with any new water development projects. The Southwest Valley Groundwater Cleanup Project has not addressed the potential that their activities may result in increased contamination of the deep-water aquifer by the shallow aquifer. Pumping down the deep-water aquifer could result in increased downward flow of the shallow aquifer.

Date 11/20/03
Dr. Richard G. Nielson

Date Nov. 20, 2003
Marjean Harrison- Nielson

Comments to Letter 03-66 (cont)

66-77 The project outlined by the Joint Proposal is designed to provide the affected public with drinking water through treatment of contaminated water consistent with the terms of the Consent Decree. The project is based on extensive studies of the water resources under the direction of the State, EPA and Technical Review Committee. A primary objective of the remedial action and the design of the proposed treatment system is to contain the contamination and keep it from spreading to other areas. The pumping required to contain the plume may result in draw down of some other wells. Private well owner impacts by water levels in Zone A that are specifically related to Kennecott will be evaluated using the procedure identified in meetings with well owners. Further action will be based on the evaluation on a case by case basis, and could include replacement water, deepening of wells, or under-sink RO treatment units.

See the Response to Common Comment 10 regarding individual well owner concerns.

The commenter is concerned that in some manner this project will take away the rights of the individual water right holder in the Affected Area. Individual water rights are not being taken by any entity involved in this project. As required by the Consent Decree, Kennecott and the JVWCD are using their own water rights as part of their commitment to provide treated municipal quality water to the public in the Affected.

The Groundwater Management Plan goals are stated in the plan document.

66-78 Potential remedies available to a well owner will be addressed on a case-by-case basis.

66-79 All of the water extracted for treatment within Zones A and B will be extracted through valid water rights that Kennecott and JVWCD currently hold for Zone A and Zone B respectively. Third party water rights are not involved.

One of the provisions for a full reduction of the Letter of Credit requires that municipal quality water come from the treatment of contaminated water located in Zone A and B, in conjunction with the delivery of the treated water via a purveyor with the water rights to bring used the water in the affected area. Both Kennecott and the District worked with the Utah Division of Water Rights to reassign water rights both entities have owned historically and used in the past for the development of either production water or drinking water (respectively). Except for the District's shallow ground water development project (of which this proposal utilizes five wells to make up lost water, i.e., "Lost Use project"), no new well applications were filed to facilitate the proposed extraction activities. Only change applications (for existing water rights) were necessary to provide the amount of water from the two contaminated zones, necessary to meet the requirements of the Consent Decree.

Comments to Letter 03-66 (cont)

Suspected impacts to the quantity of water available and provided under an assigned water rights are proposed for evaluation and remediation by Kennecott or the District, as discussed in the response to comments 1-21 in this section.
One of the provisions for a full reduction of the Letter of Credit requires that municipal quality water come from the treatment of contaminated water located in Zone A and B, in conjunction with the delivery of the treated water via a purveyor with the water rights to bring used the water in the affected area. Both Kennecott and the District worked with the Utah Division of Water Rights to reassign water rights both entities have owned historically and used in the past for the development of either production water or drinking water (respectively). Except for the District's shallow ground water development project (of which this proposal utilizes five wells to make up lost water, i.e., "Lost Use project"), no new well applications were filed to facilitate the proposed extraction activities. Only change applications (for existing water rights) were necessary to provide the amount of water from the two contaminated zones, necessary to meet the requirements of the Consent Decree.

Suspected impacts to the quantity of water available and provided under an assigned water rights are proposed for evaluation and remediation by Kennecott or the District, as discussed in the response to comments 1-21 in this section.

66-80 As noted before, the ground water system in the Southwestern Jordan Valley has been and will continue to be study to assess the potential for contaminant migration. To perform this review, Kennecott has and will continue to gather information pertaining to ground water flow, velocity, hydraulic gradient, elevation changes, etc. It is not the intent of Kennecott, or the District to have this project adversely affect other private well owners, but it is recognized that there may be impacts. Both Kennecott and the District have developed a method to address quantity and quality impacts suspected to be caused by this treatment project. Please review the response to Comment No.'s 1-20 of Section IX for further detail.

66-81 The Consent Decree and the supporting document explain how the damages were calculated. After extensive negotiations and public comment, the Consent Decree was approved by the Federal District Court. The Joint Proposal is based on reverse osmosis technology because the technology is available and proven. The Trustee could not approve a proposal based on a technology that had not been proven through testing and full-scale, ongoing operation. The Trustee agrees that it would be unwise to utilize technology from 2004 for the next forty years, if a better, more cost effective technology becomes available. However, it is impossible to predict how changes in water treatment technology may affect the costs or impacts of the project. Is it fair to assume that as the water treatment plants operate in the future, Kennecott and JVWCD will incorporate new technologies because of changing economics and changing regulatory requirements.

66-82 As new information becomes available, and is pertinent to the modeling of plume characteristics, Kennecott, DEQ and EPA will appropriately adjust the modeling parameters to include the new information

Comments to Letter 03-66 (cont)

66-83 Water rights in the southwest portion of the valley are restricted from impairing other water rights without just compensation in accordance with state statute.

66-84 The restrictions placed on the Vitro Tailings and Sharon Steel areas are designed to prevent shallow aquifer contamination from being drawn down into the principal aquifer. Similarly, the southwest remediation area also prohibits new wells that would cause the contamination to spread. Wells located in the remediation area, but screened at certain depths or restricted to certain pumping rates, could provide adequate water without causing the plume to spread. This provision of the management plan attempts to balance the stated purpose of preventing contamination from spreading with the objective of allowing for maximum use of the groundwater resource.

66-85 Several water-level data collection programs are underway in areas of the groundwater plume area. A tremendous amount of baseline data has already been collected. Data collected as part of these programs will be used to evaluate hydraulic changes in and around the contaminant plume as remediation progresses. Over 300 wells are proposed for water level monitoring, and over 100 wells have been selected for long-term water quality sampling.

Letter 03-67

United States Department of the Interior
FISH AND WILDLIFE SERVICE
UTAH FIELD OFFICE
2369 WEST ORTON CIRCLE, SUITE 50
WEST VALLEY CITY, UTAH 84119

In Reply Refer To

FWS/R6
ES/UT
04-0112

November 17, 2003

Utah Department of Environmental Quality (UDEQ)
NRD Trustee
P.O. Box 144810
Salt Lake City, UT 84114-4810

RE: Request for public comment on proposed Southwest Jordan Valley ground water treatment project.

NRD Trustee:

The U.S. Fish and Wildlife Service has reviewed the Project Summary and attended three presentations on the proposed ground water treatment project for treating contaminated groundwater. The FWS previously commented, August 15, 2003, on the UPDES Permit UT0025551, for Jordan Valley Water Conservancy District. Official Utah Division of Water Quality (UDWQ) responses to our comments have been received (Oct. 23). The FWS also provided verbal comments at the Public Hearing on September 25, 2003 and responded to questions at the meeting held October 28, 2003. The FWS has the following comments on the proposed project.

67-1 The FWS supports the goal of cleaning up the contaminated ground water. The additional clean water could reduce or delay the demand for Jordan River water associated with growth along the Wasatch Front. Good quality water in adequate quantities in the tributaries to the Great Salt Lake is essential to protecting the Lake and its associated wetlands. The Great Salt Lake and its associated wetlands are treasures of international significance that do not seem to get the respect locally they deserve. It is our collective duty as regulatory agencies to assure there is fresh water of sufficient quantity and quality to maintain these in perpetuity.

67-2 The major issue the FWS has with the Project is the proposed selection of the alternative to dispose of concentrated materials from the reverse osmosis (RO) in the Jordan River.

Comments for Letter 03-67

67-1 See the Response to Common Comment No. 3.

67-2 See the Response to Common Comment No.8. Note that JVWCD has withdrawn its UPDES.

There appear to be some changes in the permit that would require re-opening the permit for public review and comment. In general the UDWQ letter responding to FWS August 15, 2003 comments did not appear to respond to issues of loading, terminal wetlands, evaluation of beneficial uses downstream, or future monitoring for impacts to the wetlands. FWS believes there is still a lack of recognition on how the wetlands act as mini-terminal basins most of the year. Is there a plan to evaluate degradation of their function since they may react totally different to contaminants than typical wetlands? Although there is some disagreement by some of science backed effect levels, FWS is quite convinced that the guidelines produced by DOI/NIWQP in 1998 are still the best reasonable and prudent guidelines available for protecting these wetlands.

67-3 FWS understands that a number of alternatives to disposal of RO effluent into the Jordan River were considered. Disposal to the Kennecott Utah Copper Corporation would be highly preferred by FWS. In response to this alternative, prohibitive cost was indicated as the reason for not being selected, however no cost estimates were presented so the public does not have a chance to make their own evaluation. The FWS recommends that the proposal to discharge the effluent from the RO plant into the Jordan River at 2900 South be abandoned and that additional alternatives be reconsidered including the alternative of discharging this effluent to the Kennecott Utah Copper Corporation tailings pile.

Based on the current proposal, the FWS has the following more detailed comments:

67-4 There is need for a long-range plan. This plan should also include implementing rules/laws as needed to address the protection of environmental quality/function of the Great Salt Lake, and its associated wetlands. Based on a lack of current information, it appears that water quality goals and minimum water flows to this terminal system need to be addressed now. An aggressive program to establish baseline conditions in the Great Salt Lake and its associated wetlands needs to be completed. Parts of such a plan are in place and include initiation of the multi-agency Farmington Bay study, studies by USGS and others on the Great Salt Lake, and baseline studies by the FWS on a wide range of contaminants in sediment and biological tissue.

67-5 The FWS believes that further degradation of the Great Salt Lake and its associated wetlands is not justified through implementation of this project as proposed. These waterbodies provide significant support for millions of shorebirds and waterfowl, and have been recognized as sites of local, regional, national and international importance. See attached article in "Birdscapes" on pages 2-5. Shifting the environmental effects from one area of the valley to another, namely the Great Salt Lake wetlands, by implementing the preferred disposal option of this project is the wrong response. The Great Salt Lake needs to be recognized as having more value than simply being a repository for the consequences of development; it does not have limitless capacity to accept wastes without negative impacts; and, it is a terminal body of water where contaminants have extremely limited capability to be removed.

67-3 As indicated in the Responses to Common Comments Nos. 6 and 7, the tailings impoundment is the proposed disposal site for Zone A concentrates and two of the disposal options for Zone B concentrates.

67-4 The Farmington Bay study and the recently-established Great Salt Lake Water Quality Steering Committee are two important stakeholder efforts for understanding and long-range management of the Great Salt Lake ecosystem.

67-5 See the response to Common Comment No. 9.

Letter 03-67 (cont)

67-6 their assimilative capacity is not limitless either. The UPDES permit provides that concentrations in the Jordan River meet water quality standards at the point of discharge in the Lower Jordan River but there is little or no evaluation of downstream effects. To state that there will be no effect to the wetlands, suggests at a minimum that this is a system clearly not understood by UDWQ not withstanding the current lack of supportive data.

67-7 The presentation by UDWQ at the October 28 meeting at Sugarhouse Garden Center differed somewhat from past presentations. Partly this reflected a change in discharge from Outfall 001. We are still not certain whether the discharge permit authorizes concurrent operation of Outfalls 001 and 002. It was emphasized that the permit would be reviewed every 5 years, or less as needed, to determine if modifications need to be made. Please explain how once the very expensive infra-structure to use RO on the contaminated groundwater is installed any substantial change to the discharge permit to protect the environment can be implemented. Virtually every molecule of contamination will be deposited in the Great Salt Lake wetlands unless basic changes in where the effluent goes is implemented now. This leaves no option, as currently presented, but to select the alternative of pumping the effluent to the KUCC tailings and abandon the discharge permit.

67-8 At the October 28 meeting the presentation indicated that average conditions of flow would result in an average of 1.7 ppb selenium in the Lower Jordan River and that this would be increased to 2.8 ppb with operation of the RO plant. We expressed our concern, using NIWQP reported guidelines, that 2.8 ppb causes concern for wetland bird health. The welfare of these birds was not factored into recommendations for water quality criteria recommended by EPA and reflected in Utah regulations. We by no means made an exhaustive analysis of STORET data, but were concerned that additional information or analysis might provide insight into the possible effects. What we found was that average selenium concentrations in water (n=20) for the Jordan River at 21st South for the period of record of 1996 to present was actually about 2.3 ppb. With an expected increase of 1 ppb due to the proposed project resulting in an average concentration of 3.3 ppb, our concern for the welfare of bird health is further heightened. Prior to 1995 the Utah State Lab severely underestimated Se in water samples. An examination of the data showed that a large number of "less than detection" were found prior to 1996 and that these data are likely inappropriate to use in any analysis. If data pre-1995 are excluded it would indicate that the variables included in modeling the effects of increased selenium for this permit are not as conservative as originally presented. Site specific data indicate an underestimation of the potential impact to the Great Salt Lake wetlands for selenium from this project, and probable future excedences of the Utah criteria Classes 3C and 3D. Recent limited sampling by UDWQ determined that concentrations of selenium were as high as 4.5 ppb in the wetlands.

67-9 Impact on current downstream uses not adequately evaluated: The discharge permit does not adequately consider impacts to downstream users of the waters of the Jordan River. Water has historically been used for irrigation of agriculture and maintenance of freshwater wetlands. These uses are protected by water quality standards. The wetlands

Comments to Letter 03-67 (cont)

67-6 See the Response to Common Comment No. 8.

67-7 The work that JVWCD did, including recommendations from the Stakeholder Forum, represents a situation where new and arguably better options were developed. See the Response to Common Comment No. 8 for further information.

67-8 Evaluation of selenium concentrations and wildlife will likely be a component of the GSL standards work.

67-9 The permit has been withdrawn.

Letter 03-67 (cont)

Impact on current downstream uses not adequately evaluated: The discharge permit does not adequately consider impacts to downstream users of the waters of the Jordan River. Water has historically been used for irrigation of agriculture and maintenance of freshwater wetlands. These uses are protected by water quality standards. The wetlands are protected under numeric water quality Classes 3C and/or 3D; the agricultural lands are protected under water quality Class 4. Currently limited data have been collected for these wetlands by UDWQ. For the current project, the average concentration for selenium in the Lower Jordan River (as recalculated above) without the project is about 2.3 ppb, but with the project the average concentration would be approximately 3.3 ppb. The current condition is considered to be a low or no effect level, but the proposed project elevates this to a level of concern. Under the low flow condition the concentration of selenium would be about twice safe levels for DOI trust resources.

69-10

Effect level of selenium: The Department of Interior has analyzed effect levels of selenium on aquatic organisms and birds (http://www.usbr.gov/niwqp/guidelines/index.htm). EPA's and Utah's water quality standard for the protection of aquatic life in wetlands is 4.6 ppb. Reproductive impacts to wetland birds begin to occur at between 2-3 ppb due to bioaccumulation in their food supply.

Selenium is not conservative: Selenium is expected to be biologically removed when available. Some selenium will be removed in the Jordan River and the Surplus Canal. The remainder is expected to be removed primarily in the slower or no flow wetland area adjacent to the flow path of the source water as it works through the wetland complex. It is anticipated that it will affect all wetlands adjacent to the flow path and not just the upstream wetland. For example, based on data we collected at the Airport Mitigation Wetlands and at the Lakefront Duck Club wetlands, conductivities were similar in major distribution flows between wetlands but were elevated 2+ times in adjacent areas of wetland. The Jordan River, Surplus Canal and the freshwater wetlands are not direct conduits to the Great Salt Lake.

69-11

TDS – The FWS has concerns about TDS but we have little documentation to support those concerns. The primary concern is that we are unaware of any data for the Great Salt Lake wetlands monitoring major ion fate and its effects on these terminal wetlands. We are aware of recent information (Chapman et al., ET&C 19(1):210-214) indicating that TDS may be harmful to chironomids at concentrations in water beginning as low as 1200 ppm. Chironomids are an important invertebrate both as indicators of wetland health and as a food source for trust resources. Our concern is also, as terminal wetlands, that sediments may have substantially different character than anticipated and that additional loading may be detrimental.

Decision made without data on current downstream conditions: The current water quality of the Jordan River and Surplus Canal (collectively the Lower Jordan River) entering the wetlands is assumed adequate for the wetlands and is borderline for agriculture. TDS in the Lower Jordan River is near the agricultural standard at present. Conductivity measurements were taken by the FWS on August 11, 2003. Using conductivity to

Comments for Letter 03-67 (cont)

67-10 The information in this letter will be provided to the Great Salt Lake Water Quality Steering Committee as part of their work on a selenium standard for the Great Salt Lake. See also the Response to Common Comment No. 9.

69-11 Comment is noted. See response to Common Comment No. 8.

approximate TDS, and sampling the Surplus Canal which represents Jordan River water near the International Center, we found at this site that TDS likely exceeded the water quality limit on the only day sampled. Because of the nature of terminal wetlands, a high evaporative loss of water concentrates constituents in the water. Limited recent sampling of water quality by UDWQ at south shore wetlands affirms TDS regularly exceeds 1200 ppm. However, no quantified evaluation of the potential effects to the wetlands of this proposed action has been made that we are aware of. The wetlands apparently concentrate constituents in the water by 2-2.3 times or more based on conductivities taken at random. If concentration of the constituents is only proportional to change in TDS, then, what concentration is selenium? Does the proposal/permit action ignore these wetland impacts or view these public and private wetlands as treatment wetlands? Normally treatment wetlands would have to be mitigated, and managed to reduce harmful effects.

67-12

Future flows not adequately considered: Testimony at the Public Hearing indicates that current flows below the discharge points of the Salt Lake County Wastewater Treatment Facilities above 2900 South may not represent the future conditions because water currently discharged will likely be reclaimed. This would result in a substantial reduction of base flows and reduce the assimilative capacity of the Lower Jordan River. Population growth, home construction, pavement, essentially unregulated use of water-inefficient landscaping, and supporting business and infra-structure will increase contamination of existing surface waters and reduce recharge of shallow aquifers. The proposed discharge leaves little or no ability to meet these water quality challenges for at least the next 40 years. The proposed discharge permit limits fails to acknowledge and accommodate reasonably foreseeable demographic changes. UDWQ indicates that this will be addressed by adjusting limits for the UPDES permit, but, this fails to address the reasonableness of over-built RO facilities.

67-13

The following are conclusions presented by UDWQ October 28 and our brief response:

> The water quality standards in the river would not be exceeded. This appears largely true.
>
> That water quality standards in the Great Salt Lake wetlands would not be exceeded. At this time no data have been presented to warrant this conclusion and limited data on conductivity suggests this is not true. Using guidelines summarized from a large number of studies by researchers with no investment in a particular outcome, DOI trust resources may be at risk in the future under this proposed action.
>
> That selenium would not accumulate in the Great Salt Lake wetlands. This is identical to above. Every indication is that this proposed project could result in accumulation of selenium and salts in the wetlands over time.

67-12 See Response to Common Comment No. 8.

67-13 See the Response to common Comment No. 8.

Letter 03-67 (cont)

That water quality in the Great Salt Lake would not be degraded. We concur primarily because the contaminants will be short-stopped in the wetlands and only limited quantities will reach the Farmington Bay area of the Great Salt Lake.

We appreciate the opportunity to comment on the proposed NRD agreement, but find that the majority of our comments are directed at the alternative chosen to address the effluent of the RO process. We welcome opportunities to work with the Utah Department of Environmental Quality and its Division of Water Quality. If you have questions concerning these comments or wish further assistance in evaluating this proposal, please contact Bruce Waddell (ext. 125) or Nathan Darnall (ext.137) at 801-975-3330.

Sincerely,

Henry R. Maddux
Utah Field Supervisor

Enclosure

Comments to Letter 03-67 (cont)

Letter 03-68

11/18/2003 TUE 12:21 FAX 801 293 2389 NORTHWEST BIOANALYTICAL 001/002

Tandem Labs
~~Northwest Bioanalytical~~
1121 East 3900 South
Salt Lake City, UT 84124
Tel (801) 293-2400
FAX (801) 293-2389

facsimile transmittal

To: Dianne Nielson
UT Dept. of Environmental Quality

Fax #: 801 536-0061

Re: Kennecott ground water contamination clean-up by dumping contaminants into Jordan River
(2 pages with cover)

From:
Roberta Fletcher
Fax: 801 293-2389

Comments for Letter 03-68

Letter 03-68(cont)

18 November, 2003

Roberta Fletcher
5186 S. 4520 W.
Kearns, UT 84118

Ms. Dianne R. Nielson
Executive Director
Department of Environmental Quality
State of Utah
168 North 1950 West
Salt Lake City, UT 84116

Dear Ms. Nielson:

68-1 I am very upset to learn that thousands of tons of salts and ~150 lbs. of selenium are to be discharged into the Jordan River on an annual basis in an attempt to clean contaminants from the ground water polluted over the years by Kennecott Utah Copper Corporation. Although it is necessary and laudable that this corporation needs to perform this clean-up, it is like "...robbing Peter to pay Paul..." Why must we contaminate another part of our environment?

As I understand it, there have been no studies done to determine the overall impact of such dumping into the river. Such acts in the past have caused many problems not only at the site of dumping, but also downstream. Dumping salts and selenium into the river is irresponsible and appears to be a quick-fix solution with no regard for the long-term effects.

As a member of Great Salt Lake Audubon, I have enjoyed many hours walking along the Jordan River Parkway and also along the south shore of the Great Salt Lake, watching the incredible and diverse wild life. Many volunteer hours in our chapter have been spent removing visible garbage from the Jordan River over the last couple of years. The Jordan River ecosystem and the adjoining Great Salt Lake floodplains are **internationally significant wetlands** that comprise a unique and fragile lake ecosystem.

Please, please reconsider this proposal:

DEQ must set an example of preserving "environmental quality" in this state. We owe it to our children and their children.

Thank you for your time.

Sincerely,
Roberta Fletcher
Roberta Fletcher

Comments to Letter 03-68 (cont)

68-1 As indicated in the Response to Common Comment No. 8, Jordan Valley Water conservancy District has withdrawn its discharge permit for the Jordan River. Response to Common Comment No. 9 describes additional studies of the Great Salt Lake.

Letter 03-69

19 November 2003

Dear DEQ,

Although I applaud the Efforts of Kennecott and the Jordan Valley Water Conservancy District to clean the groundwater under a 72 square mile area of Southwest Salt Lake County I am concerned about the discharge of byproducts, primarily sulfates and selenium into the Jordan River. 69-1

Sincerely,

David Alan Marsh

David Alan Marsh
West Valley City

RECEIVED
NOV 21 2003
DEQ
Environmental Response & Remediation
By: _____

Comments to Letter 03-69

69-1 The discharge permit to the Jordan River has been withdrawn. See the Response to Common Comment No. 8 for additional information.

Letter 03-70

DUCKS UNLIMITED

WESTERN REGIONAL OFFICE
3074 Gold Canal Drive
Rancho Cordova, CA 95670-6116
(916) 852-2000 Fax (916) 852-2200
www.ducks.org

November 20, 2003

RECEIVED
NOV 21 2003
DEQ
Environmental Response & Remediation
By:

Utah Department of Environmental Quality
Natural Resource Damage Trustee
P.O. Box 144810
168 North 1950 West
Salt Lake City, UT 84116

To Whom It May Concern:

Ducks Unlimited (DU) appreciates the opportunity to comment on the UPDES Permit for the Jordan Valley Water Conservation District associated with the Kennecott Utah Copper Corporation's (KUCC) Southwest Groundwater Remediation Project. Cleaning contaminated groundwater is an important endeavor and one that should be pursued. However, the proposed disposal of the by-products resulting from the reverse osmosis treatment of Zone B groundwater into the Jordan River may lead to serious consequences in downstream wetlands, including detrimental impacts on waterfowl.

70-1

Ducks Unlimited has a keen interest in the health of the Great Salt Lake ecosystem and the wetlands that occur there. These wetlands support millions of waterfowl, shorebirds and other waterbirds. Great Salt Lake wetlands are a hemispheric reserve in the Western Hemispheric Shorebird Reserve Network and have been identified by DU as one of our "Wetlands Initiative" areas, which means this area warrants significant and focused conservation efforts.

DU has spent considerable time, effort and money in enhancing, restoring and conserving the very wetlands that will be affected by the proposed discharge. DU has restored or enhanced over 8,000 acres in the area to be affected including portions of the Utah Division of Wildlife Resources' Farmington Bay Waterfowl Management Area, and the Ambassador, Rudy and New State Duck Clubs. All of these areas receive water from the Jordan River and would therefore receive the by-products of the proposed groundwater treatment.

DU's concern centers on the discharge of contaminants, specifically selenium, into the Jordan River and the Great Salt Lake wetlands. The following is a list of concerns and issues that need to be resolved prior to issuing the permit:

- Terminal basins, particularly shallow wetlands such as occur along the Great Salt Lake, can become sites of accumulation of selenium. Selenium present in the water column can concentrate in the sediments of such basins.

- Bio-accumulation of selenium in aquatic systems is well documented, as are mechanisms that mobilize selenium up food chains, thus exposing vertebrate populations to potentially significant increases in dietary selenium. The resultant accumulations in animals can dramatically exceed the level of concentration of selenium in the surrounding waters.

Comments to letter 03-70

70-1 As noted in the Response to Common Comment No. 8, Jordan River Water Conservancy District has withdrawn the discharge permit.

Letter 03-70 (cont)

- Selenium, although naturally occurring and a needed nutrient, can be toxic at higher concentrations, and there is a very narrow margin between selenium deficiency and toxicity in vertebrates.
- Bio-magnification is a major concern. Studies have shown that bio-magnification can range from four to six times from one trophic level to the next.
- Selenium toxicity results in a myriad of problems for wildlife, the most notable of which is deformities in waterbird embryos and young.
- It is important to note that remediation of selenium contamination is difficult, if not impossible. Kesterson National Wildlife Refuge in California provides a stark example of this, as do the current efforts to address selenium-caused problems at Stewart Lake and Ouray National Wildlife Refuge in Utah.

In addition, if selenium and salts are undesirable in groundwater they are likewise going to be undesirable in surface water, particularly if there is a likelihood of bioaccumulation or concentration in sediments, even if the source of selenium is a result of pollution cleanup efforts elsewhere.

70-2 Given the potential for long-term harm to the Great Salt Lake ecosystem, alternatives should be seriously considered. One feasible alternative is pumping the contaminants to KUCC's tailings pond. For example, the *Proposal to the Utah State NRD Trustee and U.S. EPA CERCLA Remedial Project Manager for a Groundwater Extraction and Treatment Remedial Project in the Southwestern Jordan Valley* states that "KUCC is willing to accept the concentrate stream from treatment of Zone B deep groundwater in its tailings slurry pipeline..." When it is not possible to totally remove and render contaminants harmless, it makes sense to confine contaminants to areas where they will do no harm. In this instance, such a site is readily available and has been identified to the applicant.

DU would appreciate your response to the recommendation to use KUCC's tailings pond as the endpoint for the remediation process, and we look forward to your reply. Thank you for the opportunity to comment on this important issue.

Sincerely,

Rudolph Rosen, Ph.D.
Director

Comments to letter 03-70 (cont)

70-2 Other alternatives are being considered and work has been initiated to evaluate a selenium standard for the Great Salt Lake. See Responses to Common Comments Nos. 9, 7, and 6.

Letter 03-71

Audubon

Building 30
Fort Missoula Road
Missoula, MT 59804
Tel & Fax: 800-542-2748
www.audubon.org

Nov. 20, 2003

Dr. Dianne Nielson
Executive Director and NRD Trustee
Utah Department of Environmental Quality
P.O. Box 144810
SLC, UT 84114-4810

Dear Dr. Neilson:

RE: Request Immediate Denial of Southwest Jordan Valley Ground Water Cleanup Proposal for Plume B

On behalf of National Audubon Society, I am writing to request immediate denial of the Southwest Jordan Valley Ground Water Cleanup Proposal for Plume B.

71-1 This letter provides additional details on the value of the Great Salt Lake and its surrounding wetlands that could be affected, the potential impacts to this resource, the reason for requesting an immediate denial for Plume B, and the need to have a Full Environmental Impact Statement or similar public process including brainstorming efforts to determine how best to handle the groundwater cleanup.

Values of the Great Salt Lake and Its Surrounding Wetlands That Could be Effected

The Great Salt Lake is an incredibly valuable public resource. The lake is used for recreation, tourism, birdwatching, hunting, mineral extraction, brine shrimp cyst harvesting, helping provide powder snow for skiing, etc. To my knowledge, the full economic value of the Great Salt Lake has not been assessed. But the economic value of a thriving Great Salt Lake to one of the most urbanized metropolitan areas in the country is surely significant.

While these many values need to be better understood and appreciated, this letter will primarily emphasize the value of the Great Salt Lake to birds. Farmington Bay, Ogden Bay, Bear River Bay, Gunnison Bay and Gilbert Bay in the near future will be nominated as Globally Important Bird Areas.

The Important Bird Area (IBA) program is an international effort coordinated by BirdLife International to identify, monitor and conserve important bird areas throughout the world. National Audubon Society is coordinating the IBA program in the United States and has IBA

Comments to Letter 03-71

71-1 See the response to Common Comment No. 1. Note that public outreach and review have been increased through the Stakeholder Forum and the Joint Proposal has been revised. See also the Response to Common Comment No.9 regarding the work to establish a selenium standard for the Great Salt Lake.

coordinators in most states. The IBA program has different levels of significance for sites, some are important at the state level, some at the continental level and some sites are important globally. One of the criteria for a site of global importance is that there be documentation that the site contains at least 1% of the world's population of a bird species. Further information about the IBA program can be found at www.audubon.org/bird/iba.

In Utah the Gunnison Sage-grouse area outside of Monticello will likely be nominated as a global IBA due to the fact that Gunnison Sage-grouse is so rare. The Utah IBA program will be also nominating the five bays of the GSL as global IBA's. In large part the reason for these nominations is that the bird populations in the five bays are so abundant.

Each of the five bays of the Great Salt Lake are being nominated separately because they are somewhat different and unique systems within the greater Great Salt Lake ecosystem. These differences are discussed to some extent in "Avian Ecology of Great Salt Lake," by Thomas W. Aldrich and Don S. Paul in Great Salt Lake: An Overview of Change, edited by J. Wallace Gwynn, Ph.D., Utah Department of Natural Resources, 2002.

Farmington Bay in Great Salt Lake is likely to be most impacted by the current Southwest Jordan Valley Ground Water Cleanup proposal since the "combined treatment concentrates from the Zone B" RO plant are proposed for discharge to the Jordan River and would therefore most likely end up in Farmington Bay. Attached at the end of this letter are bird counts taken in the Farmington Bay Area during the Great Salt Lake Waterbird Surveys from 1997-2001. These counts are included in the current draft for the Farmington Bay IBA nomination. The bird numbers are taken from 12 waterbird survey sites including Farmington Bay, Farmington Bay Waterfowl Management Area, the West Side Associated Duck Clubs, New State Duck Club, the Great Salt Lake Shoreland Preserve and the shoreline of the Bay. The approximate land surveyed was 121,533 acres. Obviously, Farmington Bay is important for numerous species of birds. Just totaling the maximum number for the various survey periods for the 24 bird species listed on the chart, there were well over 500,000 birds using Farmington Bay. Another way of appreciating the significance of Farmington Bay is to note that the Bay is used by as many as 1% or more of the world's population of at least nine different bird species. This information is provided on the next page:

Draft 10-28-03 Estimated Numbers and Percent of Selected Bird Species Worldwide and on or by the Farmington Bay of Great Salt Lake Notes: Numbers for Farmington Bay are maximum numbers during a survey period for the GSL Waterbird Survey from 1998-2001 Numbers and percent are provided only for species that had 1% or over of the world's population for that species in Farmington Bay.

Bird Species	Farmington Bay
# of Birds	
% of World Population	
Gadwall	
2,795,200	30,642
100%	1.1%
Ruddy Duck	
690,000	19,716
100%	2.9%
White-faced Ibis	
More than 100,000 Breeders*	7,256
100% Less Than	7.2%
California Gull	
More than 414,000 Breeders*	19,920
100% Less Than	4.8%
Franklin's Gull	
315,608-990,864 Breeders*	16,875
100% Less Than	1.7%
American Avocet	
450,000	81,927
100%	18.2%
Black-necked Stilt	
850,000	47,596
100%	5.6%
Long-billed Dowitcher	
500,000	8,087
100%	1.6%
Wilson's Phalarope	
1,500,000	108,629
100%	7.2%

Main Source: Draft Great Salt Lake Waterbird Survey - Five Year Report (1997-2001). Submitted by Don S. Paul and Ann E. Manning, Great Salt Lake Ecosystem Project, June 2002, Utah Division of Wildlife Resources. *Waterbird Conservation for the Americas: The North American Waterbird Conservation Plan, Version 1, 2002. (www.waterbirdconservation.org)

One thing that is interesting about these nine species is that they are found in the different habitats of Farmington Bay. Gadwalls were found on the open water of Farmington Bay Waterfowl Management Area, New State Duck Club and the Associated Duck Clubs. The American Avocets and Black-necked Stilts were mostly on the shoreline of Farmington Bay and the freshwater impoundments. The Wilson's Phalaropes were likely to be found on the open water in Farmington Bay. The White-faced Ibis would be on the water areas, but also need upland habitats. In summary, Farmington Bay in all of its habitat components such as open water, mudflat, playa, and freshwater wetlands is extremely valuable for a variety of waterbirds and easily qualifies as a globally Important Bird Area.

Although, a map is not provided with this letter, it is interesting to note that most of the shoreline property directly above the meander line of Farmington Bay is owned by entities managing for wetlands, wildlife and recreation. Starting at the old causeway fill to Antelope Island from the south and going east to the causeway to Antelope Island the ownership includes National Audubon Society, duck clubs, Farmington Bay Waterfowl Management Area, The Nature Conservancy, and the Mitigation Commission. Furthermore, the shoreline of Antelope Island is owned and managed by Utah State Parks and Recreation. Farmington Bay itself is a sovereign land, managed by the State of Utah as a public trust for the citizens of Utah. The Bay is currently managed primarily by the Utah Division of Forestry, Fire and State Lands, but according to state statute the Utah Division of Wildlife Resources can have management authority over the area. In other words, not only does Farmington Bay qualify as an Important Bird Area, but numerous entities have recognized this value and are in large part managing the area for the bird values.

National Audubon Society has a specific interest in the health of Farmington Bay. The Society owns the 1,400 plus acre Gillmor Sanctuary on the South Shore of the Great Salt Lake. Some of this property is shoreline property and it borders both Farmington Bay and Gilbert Bay. Given the above statements about the importance of this area it is easy to see that National Audubon owns and manages this property because the wetlands and uplands of the Great Salt are of global importance for wetland habitat and waterbirds. National Audubon Society also is working closely with the Utah Reclamation Mitigation and Conservation Commission. The Commission has acquired 569 acres of property in this area, which is called the south shore reserve and 750 shares of water from the Northpoint Canal. The intent is to enhance an old Jordan River delta system in this area.

The Potential Impacts to This Resource

The summary from the Utah Department of Environmental Quality describes two zones of groundwater contamination in Southwest Jordan Valley. From the Zone A plume water would be extracted and delivered to the Kennecott Copper Magna Tailings Impoundment. Also, three wells would be constructed and a reverse osmosis treatment plant would treat the water and the concentrates would go to the Magna Tailings Impoundment. The Zone B area underground water would go to a reverse Osmosis Plant and be treated by the Jordan Valley Water Conservancy District. There would be 3,500 ac-feet of M&I water. The treatment concentrates from the Zone B Reverse Osmosis plant are proposed for discharge to the Jordan River.

Letter 03-71 (cont)

71-2

The flaw in this proposal is that it addresses the needs of the affected area defined as the southwestern portion of the Salt Lake Valley, without fully considering the downstream users. For example, the proposal summary from the Utah Department of Environmental Quality does not acknowledge that the concentrates that would go into the Jordan River includes an estimated 292 pounds of selenium as well as 25,000 tons of salts annually *for forty years*. Nor does the summary state that that the increase in selenium at a low flow event would go from 3.5 parts per billion to 4.2 parts per billion. Nor does the summary state that the Jordan Valley Water Conservancy District will be spending money to build a pipeline to send the concentrates from 8100 South to 2400 South where the concentrates will be dumped into the River. This pipeline is necessary since placing the concentrates the Jordan River at 8100 South would mean the discharge permit limits would be exceeded. But because there is more water in the Jordan River at 2400 South, the concentrates can be placed there.

A recent article in the Deseret Morning News by Donna Kemp Spangler ("Lawmakers Crying Fowl Over Water Cleanup Plan") quotes Don Ostler, Director of the Utah Division of Water Quality who stated, Salt isn't the issue, "Basically we're putting in the same concentration of salt that's already in the river." But selenium is more of a concern. "That's the bigger worry for duck protection."

A letter by Henry R. Maddux, Utah Field Supervisor for UWFWS to Don Ostler dated August 14, 2003 RE: UPDES Permit UT 0025551, for Jordan Valley Water Conservancy District raises concerns about both Total Dissolved Solids (TDS) and Selenium. The letter says, "Both selenium and TDS may exceed water quality standards in the Surplus Canal." Since the Surplus Canal feeds water to the West Side Associated Duck Clubs and eventually to Farmington Bay, this is certainly of concern. The letter also says, "We are concerned that selenium discharged into the Jordan River will be deposited in the freshwater wetlands surrounding the Great Salt Lake, where it would then bioaccumulate in wildlife. Any attempts to limit the concentration of selenium in the Jordan River (and adjoining ditches and canals) would be welcomed by the Service." The letter also says, "Any attempts to address these concerns at the present time, and to therefore limit the load of selenium discharged to the Jordan River would reduce the inconvenience and expense of future modifications." And finally, the letter says, "For years the Service has recommended that a selenium standard of 2 micrograms per liter is reasonable for wetland and river backwater conditions. This has been based on abundant data showing that effects to wildlife occur at concentrations between 2 and 5 micrograms per liter. Within the next few years, the Service and EPA will hopefully complete a national consultation to address the concerns over the selenium standard. Should the selenium standard become more restrictive as a result of the national consultation, the Division and the JWVWCD would likely need to find alternatives to reduce the load of selenium to the Jordan River." Thus, the USFWS has clearly raised concerns about the potential adverse effects of selenium.

The Utah Division of Water Quality has considered the selenium problem and states that a discharge for Plume B concentrates would meet the current criteria for a low flow event of 5.0 parts per billion, which is equivalent to 5.0 micrograms per liter. In fact, based upon the above criteria, the Division has approved a discharge into the Jordan River. However, at a Jordan River Natural Areas Forum meeting on Wednesday Nov. 5, the announcement was made that the Utah Division of Water Quality will be reopening the discharge permit for comment, since they will

Comments to Letter 03-71 (cont)

71-2 See the Response to Common Comment No.8 regarding changes to the proposed project.

be lowering the standard for a low flow event to 4.6 parts per billion (or 4.6 micrograms per liter) of selenium. *It should be highlighted that the proposed new standard of 4.6 is just .4 parts per billion higher than what the Division of Water Quality estimates would be a low flow event of 4.2 parts per billion and is substantially above the selenium standard of 2 parts per billion that the USFWS has recommended.*

On Nov. 13, Ella Sorensen, Manager of the National Audubon Society Gillmor Sanctuary; Wayne Martinson, Important Bird Areas Coordinator for National Audubon; John Rice, Project Coordinator with the Utah Reclamation Mitigation and Conservation Commission; and Ann Neville, Manager of the Inland Sea Shorebird Reserve met with Bill Moellmer, Environmental Scientist with the Utah Division of Water Quality. They had a very good discussion about the potential impacts of the increased selenium loading. Wayne summarized the discussion as raising these valuable points: 1. There is a range within which current science indicates that there may be impacts to wildlife. That range is from 2 to 12 micrograms per liter. 2. Some sampling indicates that the selenium going down the Jordan River to the Great Salt Lake has not been concentrating onto the wetlands by the Great Salt Lake. 3. There are various possibilities about where the current selenium might be going including seeping underground, being taken up by macroinvertebrates, being emitted as a gas, and/or going through to the Great Salt Lake where it may become nonbioavailable. 4. There is the potential that this selenium could bioaccumulate and this could be continually tested. 5. If the testing indicates there is a problem, then the concentrates from Plume B would no longer be put into the Jordan River. 6. The proposed concentrates from Plume B would result in an increase in selenium and not having this selenium go into the riparian areas, wetlands and Great Salt Lake would be better for the environment, notwithstanding the fact that it would meet present criteria.

The Great Salt Lake is a closed basin. Yet it is an incredibly active system. The shoreline and salinity levels rise and fall. The salts in the system move. One reason the Lake is so valuable for waterbirds is that it is so dynamic. Given this dynamic nature, it could also be that substances that accumulate in this closed basin such as selenium could easily become bio-available, rather than just sink into a supposedly dead sea. Furthermore, this bio-availability has the potential to affect all habitats that the waterbirds use.

Major issues regarding water quality and the Great Salt Lake, particularly Farmington Bay, are being addressed by the Utah Division of Water Quality and a group called the Farmington Bay Work Group. Theron Miller with the Utah Division of Water Quality wrote an article regarding these concerns in the Summer 2003 Friends of Great Salt Lake newsletter titled, "Assessing the Water Quality of GSL and its Wetlands." This article gives a brief history of water quality issues on Farmington Bay, discusses a study to address this and in the final paragraph says that, "The final answer to these many questions are years away . . . . We anticipate that by years three-four, we will be able to identify meaningful end points and environmental thresholds for important species."

71-3 The Division of Water Quality is to be commended for taking this proactive approach to address water quality issues on the GSL and particularly Farmington Bay. But the very questions it seeks to answer in their studies could be negatively affected by allowing additional contaminants entering the system if the Southwest Jordan Ground Water Cleanup proposal is approved.

71-3 See the Response to Common Comment No. 9.

Letter 03-71 (cont)

The primary immediate concern expressed in this letter is the proposed placement of treatment concentrates from Zone B into the Jordan River. However, the proposal to place materials from Zone A into the Magna Tailings Impoundment is also of concern. It seems that the placement of acids and heavy metals into the tailings impoundment would make it more of a hazardous zone. How will the tailings pond be used in the future? At some point will there be an attempt to cap the tailings pond and put it to some type of use? Also, the tailings impoundment is located in a somewhat unstable area. What if it collapsed, or severely eroded away at some point in the future? And given that the tailings pond is primarily placed on the former wetlands of the Great Salt Lake, would these contaminants go into the Inland Sea Shorebird Reserve and the Great Salt Lake?

71-4

There is one more factor to consider. The population on the Greater Wasatch Front is forecasted to go from over 1.7 million people today to five million people by 2050. The kinds of pressures that the Lake, the wetlands and the riparian areas will likely face in regards to water quantity, water quality, maintaining wetlands and upland buffers are enormous. Two examples of this are: 1. Sewage plants are considering reusing their water so that there would be less water available in the streams; and, 2. Jordan Valley Water Conservancy District is proposing to build 300+ shallow wells along the Jordan River. This water would be used for drinking water and would be replaced by Utah Lake water. Although I do not have the numbers, Utah Lake water is much less "pure" than the groundwater. Given the likely future pressures, and the very legitimate concerns and questions regarding the concentrates that are proposed for discharge into the Jordan River and onto the tailings impoundment, there is every need to proceed with utmost caution.

71-5

Many people are concerned about this issue. And there are many ways to summarize what could happen. One phrase often used is that there is no downstream. This is particularly true when we are talking about a closed basin. To paraphrase Ella Sorensen, we are just shifting the burden from one place to another. We really didn't know what we were doing when we allowed the groundwater to be contaminated in the first place and we don't really know what we are doing by proposing to have the water go down the Jordan River into the GSL wetlands and the Great Salt Lake itself. To close with another phrase often used about the Great Salt Lake, it could be leading towards a death by a thousand cuts.

The Reasons for Requesting an Immediate Denial of the Current Proposal for Plume B

71-6

There is a need to address the groundwater contamination. Many people have worked long and hard to address this issue in the impacted area. But due to the potential downstream effects, the current proposal for Plume B is not viable. It must have much more public and expert input.

Given the potential impacts to downstream users the public input process needs to be greatly improved. While the Utah Department of Environmental Quality has probably gone through the legal requirements for public notification, downstream users have not been fully involved in the process. For example, there was a meeting of the Westside Duck Clubs Association on Wednesday Oct. 22. Many of the duck club members present were just becoming aware of the issue. Lynn de Freitas, President of Friends of Great Salt Lake, to her credit, has been involved in this issue since the discharge permit for the Jordan River was announced in the summer.

Comments to Letter 03-71 (cont)

71-4 See the Response to Common Comment No. 7 regarding use of the tailings impoundment for concentrate disposal. The tailings would be deposited in the North Expansion Impoundment which has been engineered to maintain stability. The impoundment is also managed to minimize erosion.

71-5 There will be no discharge of concentrates to the Jordan River.

71-6 See the Response to Common Comment No. 3

Letter 03-71 (cont)

71-6 However, most downstream users have only become involved recently, because they previously were unaware of the proposal.

Not only are downstream users finally becoming aware of the issue, but the Legislative Management Committee (LMC) approved in a special meeting "a letter to the Department of Environmental Quality (DEQ), asking for a postponement of a final determination on its plan to pump and treat contaminated groundwater in south Salt Lake County and discharge it into the Jordan River until the LMC discusses the issue with DEQ at its November 18, 2003 meeting." (Quoted from Interim Highlights, October 2003.) Many wetland owners were at this meeting as you provided an overview of the project and as Don Ostler discussed the testing that the Division of Water Quality is starting to do in regards to the wetlands.

71-7 Also, there is a petition being circulated that says the undersigned residents "object to the proposed plan . . . to release an estimated 146 pounds of Selenium and 22,000 tons of salts into the Jordan River. We petition the Utah State Department of Environmental Quality to deny permission to execute this plan which will increase pollutants by 11% and 28% respectively."

The Department of Environmental Quality should be commended for their outreach to the downstream users in the last few weeks. Thanks to you and your staff for presenting to the Friends of Great Salt Lake on Oct. 28 and at the Jordan River Natural Areas Forum on Nov. 5. I also appreciate Bill Moellmer meeting with Ella and others on Nov. 13. However, given the magnitude of possible impacts, it seems that this proposal should have been fully analyzed, researched and studied by not only those in the impacted area but by downstream users and

71-8 others as well. The current proposal for Plume B should be immediately denied so that everyone can fully understand what the impacts might be and so that everyone can know that all viable options have been fully considered before major activities begin.

<u>The Need to Have a Full Environmental Impact Statement or Similar Public Process including Brainstorming Efforts to Determine How best to Handle the Groundwater Cleanup</u>

71-9 At a meeting of the Westside Duck Clubs Association and other invited individuals on Oct. 22, one of the duck club members strongly suggested that there be a full Environmental Impact Statement regarding the Groundwater Cleanup. Due to the potential impacts of the groundwater cleanup proposal and the need for better public understanding of the potential impacts and the various options available, National Audubon Society fully supports the suggestion for a Full Environmental Impact Statement or a similar public process. At this point in time, the concern for National Audubon Society is primarily with Plume B, but it would also be important to address Plume A, since numerous concerns have been raised about the cleanup of this area as well.

As was pointed out at the meeting on Oct. 22, the resources that could be severely impacted are navigable bodies of water that the U.S. Army Corps of Engineers has responsibility for. Furthermore, the Jordan River and Great Salt Lake are managed by the state of Utah as sovereign lands, or in other words, as a public trust for the citizens of the state of Utah.

Comments to Letter 03-71 (cont)

71-6 See the Response to Common Comment No. 1 regarding improved public outreach.

71-7 See the Response to Common Comment No.8.

71-8 The Joint Proposal has been revised to provide options for disposal and eliminate discharge to the Jordan River.

71-9 This Natural Resource Damage cleanup proposal does not require and Environmental Impact Statement, but there has been extensive review of the plan, including reviews by the Stakeholder-based Technical Advisory Committee, and the Department of Environmental Quality will oversee the cleanup.

Letter 03-71 (cont)

71-10

The following provides some concrete examples as to why federal agencies would want to consider a Full Environmental Impact Statement or similar type of public process.

- **The Northpoint Canal is a water source for two major Section 404 of the Clean Water Act mitigation projects. The Northpoint Canal starts north of I-80 by the Salt Lake International Airport. The Northpoint gets its water from the Surplus Canal, which gets its water from the Jordan River downstream from where the concentrates from Plume B are proposed to enter the river. As mentioned in the letter from U.S. Fish and Wildlife Service, there are concerns that both "selenium and TDS may exceed water quality standards in the Surplus Canal."** The Salt Lake Airport Mitigation is mitigation for building of the third runway at the Salt Lake International Airport. The Inland Sea Shorebird Reserve is mitigation for expansion of the Kennecott Copper Magna Tailings Pond. Although, as stated earlier, some sampling does not appear to demonstrate increased concentration of selenium in the wetlands north of I-80, the potential damage to these mitigation sites from discharges of treatment concentrates into the Jordan River raises questions in regards to the long-term viability of these mitigation projects.

- As mentioned before, The Mitigation Commission, a federal agency has purchased 750 shares of Northpoint Canal Water to deliver to the South Shore Reserve and the Gillmor Sanctuary. The major way that these wetlands are proposed to be managed is to flood the area in the spring and then let the water draw down as it would have done in playa systems in the past. There will be an effort to work with the salt systems and keep them in a good balance. This would minimize more freshwater invasive plants such as phragmites and would optimize shorebird type habitat. The concern is that this type of management would concentrate the selenium. This concern was addressed at the meeting on Nov. 13 that was mentioned earlier. On Nov. 13 Bill Moellmer pointed out that the concern for selenium loading would be true even if the concentrates from Plume B were not discharged into the Jordan River. Ann Neville provided data, which shows that since the Inland Sea Shorebird Reserve started in 1997 it has not had increases of selenium in the ponded areas of the reserve. This is true even though this area is generally managed by letting the water evaporate after filling up the ponds in the spring. On Nov. 13, there was some discussion about where the selenium might be going, but there were no firm answers. There was also discussion about how to test for selenium in these areas on an on-going basis.

- Also, the mitigation for the Legacy Parkway will use water from the Jordan River that would have increased selenium and other constituents if the Plume B proposal is approved. It is possible that the long-term viability of this mitigation could be affected.

Brainstorming efforts to determine how best to handle the groundwater cleanup are essential. As clearly stated above the downstream users of the Jordan River have not participated in the discussions on how best to address the groundwater cleanup. It is possible that the public in the Affected Area has not been fully involved either. Given the magnitude of this proposal it is clear that full public participation should occur.

Comments to Letter 03-71 (cont)

71-10 The ongoing work of the Technical Review Committee, the recently established Great Salt Lake Water Quality Steering Committee studies, and the Southwest Jordan Valley Stakeholder Forum provide opportunities for technical studies, evaluations and public involvement.

Letter 03-71 (cont)

At the duck club meeting on Oct. 22, two options for Plume B were brought up. The first option was to take the materials to a location dry them out and put the dried waste into a landfill. Another option was to pump the water into the Goggin drain and to flush it out into Gilbert Bay or what is more commonly known as the South Arm. (In regards to the Goggin Drain, National Audubon Society would have major concerns since we do have a water right from the Goggin and we have lands bordering the shore in Gilbert Bay. Furthermore, Gilbert Bay also will be nominated as a Globally Important Bird Area and any impacts on this bay should be fully considered.) On Nov. 18, The Utah Legislative Management Committee heard about a distillation proposal for Plume B that the proponents claimed would cleanup the groundwater but would have no concentrates discharged into the Jordan River. Other options that have been mentioned are to use the groundwater from Plume B for secondary water systems in the Southwest Jordan Valley area and to pump the concentrates from Plume B into the Kennecott Copper tailings pond.

71-11

The letter by Ivan Weber of the Sierra Club asks that options for both Plume A and Plume B be fully explored. The letter indicates that there are other options for metal resource recovery, or at least disposal as well as providing fresh water that would not place treatment concentrates into the Jordan River or onto the Magna Tailings Impoundment. Certainly, it is important to address the concerns that the Sierra Club is raising.

71-12

One example to point to for the kind of brainstorming that would be valuable is a Resource Roundtable that was sponsored by Kennecott Utah Copper Corporation on Nov. 14, 2000 for the Garfield Area that Kennecott owns by Saltair. This Roundtable, which was a brainstorming of future options, could be replicated in an even more powerful way by having the: 1. Public and experts be informed of the issues; 2. Public and experts brainstorm the possibilities; 3. Experts develop the viable possibilities even further; and, 4. Information fed back to the public for their review before alternatives are decided upon in an EIS process.

Of course there are many ways that the public and experts could develop the possibilities, and then review and choose the best alternative. Certainly, given the importance of the resource this type of effort must occur.

On Oct. 28 at the Friends of Great Salt Lake Issues Forum, you indicated that the comment period had been extended from Oct. 31 to Nov. 21. This was a welcome opportunity to attempt to gather more information. Soon after Oct. 28, Lynn de Freitas contacted Doug Bacon with the Utah Division of Environmental Response and Remediation and asked for a meeting to discuss alternatives. Doug has been very willing to address this request, but this type of meeting has not yet occurred. Also, on Nov. 13, Bill Moellmer indicated that the water quality standards for selenium will be lowered from 5 micrograms per liter to 4.6 micrograms per liter. This will necessitate a new permit and therefore an opportunity for another public comment period for the Plume B concentrates. Bill also mentioned that this new permit will include an anti-degradaton review, which will include a review of alternatives. It therefore seems possible that a full exploration of options and review of alternatives may be forthcoming.

71-13

In exploring options and reviewing alternatives, National Audubon Society would like to propose using the protocol used by the U.S. Army Corps of Engineers for a proposed dredge or

Comments to Letter 03-71 (cont)

71-11 The concern is noted.

71-12 Response Comments regarding this letter are provided as part of this Comment Response Summary.

71-13 See the Response to Common Comment No. 1.

Letter 03-71 (cont)

71-14

fill of wetlands. First, attempts should be made to avoid the impact; second, efforts should be made to minimize any impacts; and third, if impacts are to occur then these impacts should be mitigated. This type of approach would certainly be useful. It would mean that Plume B concentrates would not go into the Jordan River until all options to avoid this have been explored. Second, if it is determined that there are no viable options then the discharge of concentrates could be minimized. There are likely many options to reduce the volume of concentrates. For example, perhaps most of the groundwater for Plume B could be used as a secondary water system, and/or perhaps the size of the reverse osmosis plant would be cut in half and therefore the concentrates would be cut in half. Third, if it is determined after a full exploration of options that the best alternative is to place the concentrates into the Jordan River, then instead of mitigation per se, a testing and review procedure should be established to analyze the impacts on the river, the wetlands and the Great Salt Lake. This testing should be paid for by those proposing the project. Furthermore, allowing of Plume B concentrates into the Jordan River should also include very specific language that: 1. If agreed upon standards were exceeded then the action would stop; 2. Other alternatives for Plume B would need to be found; and, 3. The proponents of the proposal would pay for any necessary cleanup or resulting damages.

Note: Other organizations are proposing a one-year moratorium on approving Southwest Jordan Valley Ground Water Cleanup. National Audubon Society certainly supports this as long as steps are taken to fully address the concerns expressed in this letter during a moratorium.

In Summary

National Audubon Society requests the immediate denial of the Southwest Jordan Valley Ground Water Cleanup Proposal for Plume B. The Great Salt Lake and its surrounding wetlands and uplands have tremendous value, which could be severely impacted by the Southwest Jordan Valley Ground Water Cleanup Proposal. Based upon these potential impacts and other issues including the broad public concern and lack of understanding of the impacts of the proposal, National Audubon Society requests that the immediate denial of the current proposal for Plume B be followed closely by a commitment to a Full Environmental Impact Statement or similar public process. This effort should include public and expert brainstorming efforts to determine how best to handle the groundwater cleanup.

Thank you for thoughtfully considering the content of this letter and the requests that are being made.

Sincerely,

Lynn Tennefoss

Lynn Tennefoss
Vice President for State Programs and
Chapter Services
National Audubon Society

Comments to Letter 03-71 (cont)

71-14 See the Responses to Common Comments No. 2 and 9 regarding the evaluations and options which have been and will be evaluated as the cleanup proceeds. The cleanup needs to proceed in order to remove contamination and limit migration of the plume.

Cc: Bob Perciasepe, Chief Coordinating Officer, National Audubon Society
Marlyn Twitchell, Assistant Counsel for Policy, National Audubon Society
Sean McMahon, Policy Division, National Audubon Society
Ella Sorensen, Gillmor Sanctuary Manager, National Audubon Society
Wayne Martinson, Utah IBA Coordinator, National Audubon Society
Don Ostler, Director, Utah Division of Water Quality
Richard Bay, Chief Engineer and Assistant General Manager, Jordan Valley Water Conservancy District
Marcelle Shoop, Associate General Counsel, Kennecott Copper Corporation
Henry Maddox, Utah Field Supervisor, U. S. Fish and Wildlife Service
Kevin Conway, Director, Utah Division of Wildlife Resources
Joel Frandsen, Director, Utah Division of Forestry, Fire and State Lands
Brooks Carter, Chief of the Intermountain Section, U.S. Army Corps of Engineers
Mike Weland, Executive Director, Utah Reclamation Mitigation and Conservation Commission
Debbie Goodman, Lobbyist, Audubon Council of Utah
Jeff Salt, Executive Director, Great Salt Lake Audubon
Dick West, Westside Duck Clubs Association
Kent Covey, New State Duck Club
Lynn deFreitas, President, Friends of Great Salt Lake
Ivan Weber, Utah Chapter of the Sierra Club

The following is from the Draft Important Bird Nomination Form for Farmington Bay.

Ornithological Importance

List the species for which this site is important, the season for which the site is important, the occurrence, the population type , the abundance , the minimum and maximum numbers (estimates are okay), the units, the years on which this count or estimate is based, sources of information and data quality. Use Codes for Season (Se), Occurrence (Occ), Population Type (PT), Abundance (Ab), Units (Un), Sources and Data Quality.

Species Name (Scientific name preferred)	Se[1]	Occ[2]	PT[3]	Ab[4]	Min # per Season	Max # per Season	Un[5]	Which Years*	Sources [6]	Data Quality[7]
Green-winged Teal	FM	1	T	A	15,564	25,944	A	17(99,98)	A	2
American Coot	FM	1	T	A	11,331	32,309	A	17(01,98)	A	2
American Widgeon	FM	1	T	A	223	15,438	A	17(01,00)	A	2
Canada Goose	B	1	T	A	551	1,663	A	9(99,98)	A	2

[1] Se or Season for which quantitative data are based; R=Resident, B=Breeding, N=Non-Breeding, W=Winter, SM=Spring Migration, FM=Fall Migration, U=Unknown, E=Extinct at Site.
[2] Occ or Occurrence; 1=Native, 2=Introduced, 3=Vagrant, 4=Reintroduced, 5=Uncertain.
[3] PT or Population Type; T=Total, N=Number Per Square Kilometer.
[4] Ab or Abundance: A=Abundant, C=Common, F=Frequent, P=Present, R=Rare, U=Uncommon, Un=Unknown
[5] Un or Units: A=Adults and Juveniles, B=Breeding pairs, O=Adults Only, M=Males Only, Un=Unknown
[6] Sources: 1=Published Report, 2=Surveys (Christmas Bird Count, Breeding Survey, etc.) 3=Personal Observation
[7] Data Quality: 1=Good, 2=Medium, 3=Poor, 4=Unknown

Letter 03-71 (cont)

Cinnamon Teal	FM	1	T	A	1,881	8,975	A	15(99,00)	A	2
Eared Grebe	FM	1	T	A	10	15,336	A	18(01,98)	A	2
Gadwall	FM	1	T	A	3,788	30,642	A	16(00,01)	A	2
Lesser Scaup	SM	1	T	A	1,400	7,815	A	1(99,00)	A	2
Mallard	FM	1	T	A	7,231	12,857	A	16(01,99)	A	2
Northern Pintail	FM	1	T	A	7,773	28,375	A	17(01,98)	A	2
Northern Shoveler	FM	1	T	A	12,534	30,176	A	15(99,01)	A	2
Redhead	FM	1	T	A	376	5,104	A	14(01,98)	A	2
Ruddy Duck	SM	1	T	A	4,287	19,716	A	1(99,01)	A	2
White-faced Ibis	B	1	T	A	3,125	7,256	A	11(99,98)	A	2
California Gulls	B	1	T	A	2,030	19,920	A	15(00,98)	A	2
Franklin Gulls	FM	1	T	A	1,649	16,875	A	16(01,00)	A	2
Ring-Billed Gulls	FM	1	T	A	89	3,671	A	17(01,00)	A	2
American Avocets	FM	1	T	A	14,604	81,927	A	16(98,00)	A	2
Black-necked Stilts	FM	1	T	A	3,336	47,596	A	13(98,00)	A	2
Long-billed Dowitchers	SM	1	T	C	750	8,087	A	4(98,01)	A	2
Red-necked Phalaropes	SM	1	T	F	0	17,354	A	4(98,99)	A	2
Sanderlings	SM	1	T	F	2	2,062	A	4(98,01)	A	2
Western Sandpipers	FM	1	T	F	1	9,762	A	10(98,01)	A	2
Wilson's Phalaropes	FM	1	T	C	30	108,629)	A	13(98,99)	A	2

*The first number is for a specific survey period. The next number is for the year with the min. # per season. The last number is for year with the max. number per season.

Note: Information on numbers for selected species by survey site is available upon request.

Specify Sources:

A. Data from Utah Division of Wildlife Resources, Great Salt Lake Water Bird Survey for years 1998- 2001

Comments to Letter 03-71 (cont)

Letter 03-72

Jordan River
Natural Areas
Forum

The Jordan River Natural Areas Forum is dedicated to promoting awareness, acquisition, management and restoration of natural areas along the Jordan River balanced with the human uses of the river corridor.

Forum Members:
Bluffdale City
Draper City
Envision Utah
Great Salt Lake Audubon
IHI Environmental
Midvale City
Murray City
Murray City School District
National Audubon Society
North Salt Lake City
Riverton City
Rose Park Neighborhood Parkway
Salt Lake City
Salt Lake County
Salt Lake County Fish and Game Association
Salt Lake Soil Conservation District
Salt Lake Valley Mosquito Abatement District
Sandy City
State of Utah
South Jordan City
South Valley Jordan River Parkway
Taylorsville City
Tree Utah
US Army Corps of Engineers, Water Resources Planning
US Fish and Wildlife Service Utah field Office
US National Park Service Rivers, Trails & Conservation Assistance Program
US Natural Resource Conservation Service
Utah Reclamation Mitigation & Conservation Commission
West Jordan City
Woods Cross City

c/o GOPB Planning Section
116 State Capitol
Salt Lake City, UT 84114
PH: 801-538-1027
FAX: 801-538-1547

November 21, 2003

Dianne Nielson
Executive Director
Utah Department of Environmental Quality
NRD Trustee
P.O. Box 144810
Salt Lake City, Utah 84114-4810

RE: Southwest Jordan Valley Water Cleanup Project Comments

Dear Dr. Nielson:

Thank you for taking the time to meet with our Steering Committee and providing us with your expert information regarding the referenced project. We also appreciate the very informative presentation and discussion with Bill Moellmer, Doug Bacon and Chris Imbrogno.

72-1 JRNAF supports the cleanup of the groundwater that has been contaminated by the Kennecott mining operation. We recognize the need for drinking water in many of the communities that are members of JRNAF. However, we are against the plan to discharge the concentrates from the Zone B RO plant into the Jordan River. We understand that alternatives to that discharge plan have been proposed. We would like all alternatives to be fully studied. The State is a member of JRNAF and we encourage you to take advantage of the full range of expertise of the members. We would like the opportunity to participate in the process by providing expertise and/or commenting on alternatives.

72-2 In general we think more time is needed to develop a better plan options on how to how handle the contaminates from the Zone B RO plant. The Jordan River has been subjected to waste dumping for over a hundred years. We support efforts being made to clean up the river. However, we believe the discharge of additional contamination will be counterproductive to preserving and restoring the Jordan River Corridor.

Sincerely,

Mark Bedel

Mark Bedel
Chair

Comments to Letter 03-72

72-1 There will be no discharge of concentrates to the Jordan River; see the Response to Common comment No. 8.

72-2 Jordan Valley Water Conservancy District and Kennecott have taken additional time to identify options for disposal of RO concentrates, as discussed in the Response to Common Comment No. 6.

Letter 03-73

WATER REUSE ASSOCIATES 1780 West 9000 South, Suite 301
West Jordan, UT 84088
Phone: 1-800-212-9898

November 21, 2003

Diane Nielson, Trustee
Utah Department of Environmental Quality
P.O. Box 144810
Salt Lake City, Utah 84114-4810

Subject: Another Proposal for Zone B Remediation and Treatment of the Kennecott Groundwater Contamination Plume in the southwest quadrant of the Salt Lake Valley

Dear Ms. Nielson:

Enclosed please find a proposal for the extraction, remediation, and treatment of Zone B contamination plume in the southwest quadrant of the Salt Lake Valley. The proposal takes a comprehensive approach in resolving the water resource and water right problems of southwest Salt Lake Valley. Further, the proposal avoids transferring the contamination problem from the southwest valley aquifer to the lower Jordan River.

Also, enclosed is a brief statement of qualifications for Water Reuse Associates. Water Reuse Associates is comprised of four seasoned and qualified individuals who have prepared and propose to implement the proposed plan.

Water Reuse Associates respectfully requests that you provide equal consideration to the enclosed proposal. We can and will provide additional information regarding the proposed plan as it is developed in more detail.

Sincerely,

Tom Belchak

THANK YOU!

WATER REUSE ASSOCIATES

"Advocating responsible stewardship of our most precious resource, now and into the future."

Comments to Letter 03-73

73-1

Southwest Salt Lake Valley Groundwater Cleanup Project, Proposal for Zone B Treatment and Supply Facilities -- Southwest Valley Water Reuse Facility

Operations of the Kennecott Utah Copper Corporation (Kennecott) have contaminated a large area of the ground water aquifer in the southwest quadrant of the Salt Lake Valley. As a result, the State Engineer has restricted an area of about 78 square miles of the valley from groundwater development. For clean up purposes, the ground water contamination plume has been divided into two zones, Zone A and Zone B.

This proposal involves treatment of the Zone B contamination plume only. Zone A, which by far has the greatest contamination, will be treated at a Kennecott reverse osmosis (RO) treatment plant constructed on Kennecott property. Zone B contamination, consisting chiefly of high sulfate concentrations, will be treated by the facilities proposed here.

Privatized Distillation Treatment Plant – Comparable Cost – Communities and Water Purveyors Win

For treatment of Zone B contaminated groundwater, a privatized distillation water treatment plant, to be known as the Southwest Valley Water Reuse Facility, is proposed. This treatment plant will employ newly available equipment and technology to economically distill and remove the water from the ground water contaminants, producing municipal quality drinking water. This drinking water can be delivered directly to nearby communities affected by the contamination or to JVWCD for distribution through its system to other affected communities. With newly available energy saving distillation technology and other plant improvements, the drinking water can be provided at comparable or less cost than current JVWCD wholesale water rates.

Better Protection of the Public and the Environment – More Fail-safe and No Waste Stream – The Public and Environmental Community Win

The Southwest Valley Water Reuse Facility will protect the public health, the environment of the Jordan River, and the world renowned marshes of the Great Salt Lake. The Southwest Valley Water Reuse Facility will employ distillation technology that is considerably more fail-safe and maintenance free than reverse osmosis treatment technology. Distillation does not have filter fouling and contaminated water break-throughs experienced by RO plants. The public health and safety is thus better protected.

Further, reverse osmosis produces a concentrated waste stream that must be disposed of while distillation does not. The Southwest Valley Reuse Facility will distill and remove virtually all water from the contaminants. The facility will crystallize the salts and contaminants formerly dissolved in the water into solids that can be sold commercially or disposed of in a "safe" repository. There will be no discharge of contaminants or concentrated salts to the Jordan River and the Great Salt Lake marshes.

Thus, the proposed Southwest Valley Water Reuse Facility is not a "pump and dump" scheme where contamination is removed from contaminated ground waters only to be dumped into the Jordan River causing contamination of surface waters. Rather, the Southwest Valley Water Reuse Facility will truly remove contaminants from the environment and will place them in a "safe" repository and/or will recycle them through commercial use.

Funding Solely From Kennecott – The Public and Kennecott Win

The Southwest Valley Water Reuse Facility can be constructed and operated within the funding available from Kennecott only. *No public funds will need to be expended.* Whereas, the Kennecott/ JVWCD proposal requires JVWCD to fund and expend ten's of millions of dollars for the plan to work. The Southwest Valley Water Reuse Facility will satisfy all conditions of the 1995 Consent Decree, without additional requirements of public funding. Kennecott will thus fully fund the cleanup.

No Lost Use – Near 100 percent Recovery – The Public Wins

There will be virtually no lost use and no need for a lost use treatment facility. Zone B contaminated ground water will be removed from the aquifer for treatment and remediation at approximately the same locations as currently proposed by Kennecott and the JVWCD under their Zone B treatment scheme. But, due to the nearly 100 percent recovery of water from the distillation process, there will be no waste stream to be dumped into the Jordan River. There will be virtually no lost use of the ground waters removed. The expense of a lost use facility and the expense of a lengthy waste

73-1 A copy of the proposal has been provided to Jordan Valley Water Conservancy District and Kennecott for their consideration. Also see Response to Common Comment No. 4 regarding use of other technologies for water treatment.

stream pipeline (over 7 miles) and potential environmental damage are thereby avoided.

Further, because there is no lost use, the Southwest Valley Water Reuse Facility will provide 4,300 acre-feet of public drinking water and not just the 3,500 acre-feet required under the Consent Decree. Thus, an additional 800 acre-feet of public drinking water can be provided without an additional lost-use treatment facility as Kennecott and the JVWCD have proposed.

More Equitable - Benefits to All Parties Damaged – All Impacted Parties Win

The communities and individuals of the southwest quadrant of the valley impacted by the Kennecott's contamination will be better compensated with this proposal. A very large number of impacted individual well owners and the communities of the southwest Salt Lake Valley were left out of the Consent Decree. The current Kennecott/JVWCD plan addresses only community interests and leaves individual impacted well owners to fend for themselves. With the privatized Southwest Valley Water Reuse facility, impacted communities, impacted individuals, and the JVWCD can provide their water rights to the facility. In return, they can receive water cost discounts or a proportionate share of the facility revenues. Thus, because all parties damaged can be benefited, the proposed Southwest Valley Water Reuse Facility is a more equitable mitigation proposal.

Can Reduce Appropriation of Ground Water in Southwest Salt Lake Valley – The State and the Public Wins

As compensation to individual water right holders, Kennecott can provide water rights to the Southwest Valley Water Reuse Facility in return for retirement and cancellation of the individual's water rights and a water discount or revenues from the facility. Ground water appropriations in southwest Salt Lake Valley will thereby be reduced.

As development occurs, communities can require water rights for lands developed to be turned over to the communities. The communities can then hold and/or retire those well water rights that are beyond the ability of the aquifer to supply the Southwest Valley Water Reuse Facility. In return, the communities can receive a replacement water supply from JVWCD. Again, reduction in southwest Salt Lake Valley ground water appropriations will result.

Can Provide for Water Reuse – The Communities and the Public Win

The Southwest Valley Water Reuse Facility will have capability to distill and treat effluent from the South Valley Wastewater Reclamation Facility. The distilled effluent can provide secondary (outdoor irrigation) water supplies to Salt Lake Valley communities. Distillation is more reliable as it replicates the natural water cycle by evaporating the water out of the waste. The purified and truly recycled water can then be used for outdoor irrigation. Demand on drinking water supplies in the communities will be reduced by 3 to 4 times for every acre-foot of wastewater treated and more homes can served with the same amount of drinking water.

Meets all Federal Requirements – The Public and Federal Regulators Win

The Southwest Valley Water Reuse Facility plan includes without modification the approved Zone B contaminated groundwater extraction wells. The plan includes extraction and treatment of the full 4300 acre-feet anticipated under the Kennecott/ JVWCD plan. The Southwest Valley Water Reuse Facility plan differs only in a more fail-safe treatment process and in environmentally sound waste disposal. Thus, the Southwest Valley Water Reuse Facility plan will provide equivalent extraction and remediation of the groundwater plume while protecting the environment and avoiding any lost use of extracted water.

The Plan

The Southwest Valley Water Reuse Facility plan is simple. Seven ground water extraction wells, located where Kennecott's studies have shown will be most effective, will withdraw contaminated Zone B ground water from the aquifer. A collection pipeline will convey the extracted water from the wells to the Southwest Valley Water Reuse Facility. The water will be distilled to produce drinking quality water at less than 250 mg/l total dissolved salts and less than ½ of all other maximum water quality standards. The drinking quality water will then be conveyed to southwest valley communities through existing or new transmission pipelines. Salts and contaminants will be solidified and commercially sold or trucked to a "safe" repository. There will be no discharge of contaminants into the Jordan River or the environment.

The Southwest Water Reuse Facility will be sited where the facility can also treat and recycle wastewater, Jordan River/Utah Lake water, and canal water.

Southwest Water Reuse Facility Description and Process

The Southwest Water Reuse Facility is proposed to use water evaporation/distillation technology to treat the contaminated water extracted from the Zone B aquifer. The reuse facility will process treat 2,790 gpm of incoming contaminated Zone B water to produce 2,790 gpm of drinking quality water and a waste product of crystallized salt and contaminants that can be sold commercially. A total of 4,300 A.F. will be extracted and treated each year to produce 4,299 A.F. of 250 mg/l TDS or less drinking quality water.

The water reuse facility will use a five-step process to completely convert the contaminated incoming stream to a stream of drinking water and and crystallized salt. In the first step, the water will pass through 25 energy efficient evaporation/ distillation units capable of producing 78 gallons per minute each of distilled water. Injection of sodium carbonate into the incoming stream is expected to be necessary as a pretreatment to prevent formation of calcium sulfate scale in the units. The distilled water will be mixed with part of the incoming stream to produce an outgoing stream of drinking quality water having less than 250 mg/l TDS and other constituents at levels comparable to the water quality that would be produced in the proposed JVWCD RO plant.

The waste stream will be treated in four additional steps. First, the waste stream will pass through a filter system to remove precipitated solids. For the third and fourth steps, the waste stream will be passed in series through two more sets of evaporation/distillation units (7 units in the third step and 2 units in the fourth step) each producing distilled water and a successively concentrated waste stream. The distilled water will mixed with the outgoing drinking water.

The final waste stream of about 25 gpm will be treated by a specialized distillation unit that employs rapid spray evaporation technology to flash evaporate the remaining water and produce distilled water and crystallized salts. If this last step proves uneconomical, the final waste stream of about 30 acre-feet will be sold commercially or pond and/or cooling tower evaporated to solidify the salts and contaminants. In this case 30 acre-feet of the 4,300 acre-feet total would be lost to use.

In summary, a total of 34 evaporation/ distillation units and one rapid spray evaporation unit (if economical) will treat the 2,790 gpm incoming contaminated groundwater stream to produce drinking water will little to no loss.

The 34 evaporation/distillation units proposed will be highly energy efficient factory built units. They will be self-contained units housed in a standard ISO metal shipment container measuring 20 feet in length and 8 feet by 8 feet in cross section. The units will be insulated and will not need protection from freezing. No building will be needed to house them. All that will be needed will be to construct concrete footings for the units to rest upon and to construct the necessary incoming and outgoing piping and electrical hookups. The land around the units can be landscaped in traditional urban lawn or in native grasses. An operations building will be needed only for the pretreatment facilities, rapid spray evaporator, pumping stations, maintenance shop, office, and laboratory. Salts/solids handling and loading facilities will also be required.

The cost of the water reuse facility is estimated to be within the funds available from Kennecott under the Consent Decree. The operation and maintenance cost of treating the water is estimated to be comparable to the JVWCD wholesale water cost to the communities. Cost estimates are now being verified. Detailed costs estimates for construction and operation of the facility will be provided to you following verification. More details about the distillation units, the manufacturer, the projected power use per unit and other unit specifications will also be provided

WATER REUSE ASSOCIATES

10832 Natalie Ct., Highland, UT 84003

STATEMENT OF QUALIFICATIONS

Water Reuse Associates is a newly conceived project management team of highly qualified individuals from varied backgrounds with more than 100 years of collective experience, particularly applicable to the Southwest Salt Lake Valley Zone B groundwater recovery project. Water Reuse Associates team members are seasoned professionals who together have the required hands-on experience and knowledge needed to manage and complete the Zone B remediation project. These seasoned professionals stand ready to manage and complete the design and construction of Zone B groundwater remediation, treatment, and supply facilities and to successfully place the facilities into operation.

HIGHER EDUCATION OF WATER REUSE ASSOCIATES TEAM MEMBERS

- B.S. Civil Engineering/Structural Engineering/Hydrogeology/Watershed Science
- M.S. Civil Engineering
- J.D. Law
- Ph.D. Civil and Environmental Engineering

LICENSES, CERTIFICATES, DESIGNATIONS, AND ASSOCIATIONS

- Registered Professional Engineers in the State of Utah
- Grade IV Utah Certified Water Systems Operator
- Soil and Groundwater Sampler Certification
- Graduate Research Assistant, Teaching Assistant, Teaching Fellow
- Licensed Real Estate Broker, Graduate Realtor Institute, Council of Residential Specialists
- Certified Real Estate Appraiser
- Member of Utah State Bar

SUMMARY OF SELECTED POSITIONS, APPOINTMENTS, SKILLS & KNOWLEDGE

- Senior, Managerial, Supervisory, and Staff Engineers in both private and public sectors.
- Members and/or Chairperson of various committees, including technical review, planning, contract negotiations, master planning, financing, board member, expert witnesses.
- Study team members for surface/groundwater interaction, aquifer storage and recovery, water rights review, salinity management, groundwater recharge and well recovery, funding alternatives including grants, cooperative agreements, letters of credit, rate systems, capital improvement funds, enterprise funds, and negotiated settlements.
- Knowledge and specific training in federal and state regulations, including CERCLA, RCRA, Clean Water Act, SDWA, UST, Wellhead Protection, Water Rights, building codes, development ordinances, water systems construction, testing, operations.

SELECTED PROJECTS, STUDIES, AND PUBLICATIONS

Projects

- Desalination Planning and Feasibility Studies and Investigations
- Water supply planning including sizing and siting of water treatment plants for Las Vegas Valley, NV; El Paso, TX; Rincon Valley, NM; Las Cruces, NM; and Strawberry Valley Project, UT.

- Reclaimed Wastewater Master Plan development for the use of reclaimed wastewater for parks, golf courses, and other large institutional irrigated areas.
- Design and construction supervision of pipelines, pump stations, reservoirs, and other water system facilities.
- Hydrogeologic review of mining discharge waters for feasibility of use for irrigation systems of a developing city.
- Salinity Management and Control Plans through water quality and supply modeling.
- Supervision of hydrogeologic remediation projects.
- Surface/groundwater interaction studies.
- Design and Construction Management of $100 million and $40 million (2003 dollars) material handling facilities.
- Hydroelectric power generation feasibility study.
- Capital improvements projects totaling $10's of millions for several jurisdictions.
- Development and use of computer simulated flow analysis in evaluation and design of water supply and wastewater transmission projects.
- Water treatment plant efficiency improvement and operations management investigations.
- Long term pump testing and well monitoring for production water wells.
- Compliance monitoring, testing, and reporting for culinary water systems with extensive service areas within large metropolitan areas.
- Monitoring and reporting water use of entire hydrologic basins.
- Preparation of successful NPDES Clean Water Act permit applications.

Papers and Publications

- Development of Salinity Management Alternatives, El Paso-Las Cruces Regional Sustainable Water Project.
- New Mexico /Texas Aquifer Storage and Recovery Project.
- Regional Water Supply Plan for the Lower Rio Grande Valley Above Leasburg.
- Reclaimed Water Use Plan.
- New Mexico/Texas Joint Conveyance Facility for Rio Grande Project Water, Phase I Report.
- Municipal and Industrial Water Use Studies (various locations)
- Last Chance Power Plant Feasibility Study

(additional project, background, and experience information available on request)

WATER REUSE ASSOCIATES

"Advocating responsible stewardship of our most precious resource, now and into the future."

Letter -03-74

November 21, 2003

To: Dianne R. Nielson, Executive Director
168 North 1950 West, Salt Lake City, Utah 84114

From: Pat Cory, Water Watch of Utah
2060 Evergreen Avenue, Salt Lake City, Utah 84109

Reference: Natural Resources Damage (NRD) Trustee
Southwest Jordan Valley Ground Water Cleanup Project

The Department of Environmental Quality motto is "To safeguard human health and quality of life by protecting and enhancing the environment."

74-1 The issuance of a permit to dump 22,000 tons of metallic salts and Selenium into the Jordan River and increase the salinity by 28% is a terrible waste of funds and certainly does not follow the DEQ motto.

This discharge permit appears to be government policy by governmental immunity. The permit is "reactive" and not "pro-active" for the health, safety, and welfare of the public of the State of Utah. The permit to pump and dump to correct the Kennecott plume damage is solution by dilution and is tantamount to criminal.

Dilution is not the solution. To dump the reverse osmosis reject and dilute with affluent is a taking.

Metallic salts and selenium dumped into the Jordan River will contaminate the Jordan River, the Great Salt Lake, and aquifers to which waters from this river and lake contribute. Jordan River Today; Great Salt Lake Tomorrow; In the Food Chain and New Aquifers Day After Tomorrow.

It is a crime against the health, safety and welfare. Kids float on inner tubes down the Jordan River, people fish in the Jordan River, and people picnic along the Jordan River Parkway.

Federal dollars for the trails given to the Jordan River Sub Basin committee should be "yanked" if the Jordan River is allowed to become an environmental waste stream. This would be putting an attractive trail next to a man made evolving ecological disaster.

74-2 Not one dime should be released until Kennecott/Jordan Valley have completed an environmentally responsible plan for the contaminated plume and reverse osmosis reject. This responsible plan should be published in a large page ad to the public with the names of elected officials approving the plan noted.

One possible correct approach put on the table earlier in hearings was to dump the reverse osmosis reject from the B plume and the A plume into clay lined or man made

Comments to Letter 03-74

74-1 See Response to Common Comment No. 8. Jordan Valley Water Conservancy District has withdrawn its discharge permit.

74-2 See Responses to Common Comments Nos. 6 and 9 regarding options for managing reverse osmosis concentrates.

lining evaporation ponds. Then the sludge could be scraped off and processed in a prudent health conscious way. The evaporation rate in Utah is three to four times the precipitation rate, so lined ponds are a feasible solution.

The pump and dump plan for reverse osmosis reject into the Jordan River needs to be exposed for the crime it is against water quality in the second driest state in the union.

The so-called saving of Kennecott money now will just mean giant costs later to clean up larger bodies of water and aquifers. Let us not leave a legacy of larger contamination.

The twists and plots of this would make a wonderful movie of big business running roughshod over the environment. And it all started under the leadership of Governor Michael Leavitt's watch (now head of EPA).

The taking of large amounts of money to clean up the water quality of Central Valley to meet Health Standards and then turn around to allow Jordan Valley/Kennecott to pull a re-pollution fast one is abuse of the Clean Water Act and Point Source Pollution.

74-3 As Water Watch of Utah we support the clean up of the Jordan River with attractive trails, healthy vegetation, and life. We support the earlier responsible and pro-active decision to contain both plumes. The B plume should be put into lined evaporation ponds, thus meeting the motto of the department. Safety and welfare for the public is achievable.

Pat Gray
Water Watch of Utah

74-3 See Response to Common Comment No. 3