

**E-mail No. 04-01**

**From:** [kathy van dame]  
**To:** <nrdtrustee@utah.gov>  
**Date:** Mon, Jul 26, 2004 4:40 PM  
**Subject:** comments - revised documents NRD

Thank you for the opportunity to comment on this action. I look forward to seeing the response document.

Peace,  
Kathy Van Dame  
Wasatch Clean Air Coalition  
1148 East 6600 South #7  
Salt Lake City, Utah 84121  
(801) 261-5989 [email address]

\*\*\*\*\*

1-1 | 1. Any approved agreements should contain provisions allowing for the use of new technologies. At the July 14 hearing, one proposal was given for an advanced distillation technology that would have zero discharge.

There may be other opportunities that will provide superior environmental performance to deposition of reverse osmosis by-product water either in the tailings impoundment or the GSL. We should not allow this process to "grandfather" proposals that are no longer "state of the art".

\*\*\*\*\*

1-2 | 2. Efforts should be made to recharge the contaminated aquifer with high quality water. Reportedly the only recharge currently occurring is from irrigation canal water, which can contain fertilizers, pesticides and other contaminants. This water is not high quality water and presents the risk of introducing different contaminants to the current problem. This could imperil the third requirement of the Proposal to the NRD Trustee at 3.1, pg 11: Remediate the aquifer over the long term.

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1-3 | 3. The sentence after Table 5.2B pg 15 states: JWCD will monitor metals in the shallow aquifer wells. This monitoring will be done on a quarterly basis for five years and a yearly basis thereafter. These results will be reported to DEQ on an annual basis showing the trends of all previous data collection. This data will enable the tracking of metals

**Response to E-mail No. 04-01**

**1-1:** See the Response to Common Comment No. 4.

The Trustee's approval of the project as proposed does not preclude the future adoption of new or improved treatment technologies that would benefit the project.

**1-2:** See the Response to Common Comment No. 2. As noted during the characterization work, draw downs on the water levels are predicted and necessary to gain containment of the contaminated water in Zone A. Predicted draw down impacts in Zone B are less severe than those in Zone A.

The requirement in the Consent Decree to "remediate the aquifer over the long term" was set for the contaminated water, not water levels. However, the Trustee has worked with the proposing parties to address water level reductions and subsequent impacts to water right owners in the Affected Area. See the Response to Common Comment No. 10.

Reinjection of water was preliminarily investigated during the project characterization work, and may be pursued by the project proponents in the future.

**1-3:** The project proponents have recommended to the Trustee that they sample the feed water delivered from the proposed shallow water wells located in Zone B, as a means to assist in the evaluation of potential dissolved metals migration from the Sharon Steel Superfund site nearby. The monitoring point is located right before the blended water from these wells enters the plant as the feed water. If metals detection takes place above inappropriate levels, the project personnel will be able to

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migration into JWCD's shallow wells if it occurs.

COMMENT A. This should state  
JWCD will monitor metals in EACH shallow aquifer well....

1-3

If something less than sampling each well for metals is adequate, the basis for that finding should be publicly evaluated. If not the requirement should specify that each well be sampled.

COMMENT B. These results should be reported to DEQ WITHIN 30 DAYS OF SAMPLING EVENT showing the trends of all previous data collection. The results of the sampling should be reported promptly to DEQ, where the values will be evaluated by disinterested parties, and will be available to citizens under GRAMA rules.

\*\*\*\*\*

The second bullet point after Table 5.6B pg 20 states:

· JWCD may only deliver 1000 acre feet of concentrates per year, determined on a five year rolling average basis, with no more than 1100 acre feet delivered in any calendar year.

1-4

COMMENT

The integrated design proposed to send 974 AFY to the tailings impoundment. This leaves very little leeway if the RO efficiency is not 85% (as reportedly is happening in Zone A). The proposal should spell out what remedy will be applied if RO efficiency slips, and the potential exists of exceeding the 1000 AFY rolling 5 year. The lack of wiggle room here may set the integrated design up for failure.

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**Response to E-mail No. 04-01 (cont.)**

**1-3 (cont.):** assess from which well the increase concentration is coming from. Also note, that other monitoring wells associated with the remedial work performed at the Sharon Steel site will be able to first detect the migration of contaminants off the Sharon Steel site, prior to this proposed monitoring component.

The submission of sampling results within a specified time frame is guided by permitting requirements or negotiated terms. In the case of this proposed sampling component, the project personnel recognized that the Sharon Steel site had a monitoring requirement of quarterly samples. The proposed sampling of the shallow aquifer feed water to the Zone B RO plant was considered to be secondary in terms of priority for assessing metals migration. The monitoring results collected quarterly at the Sharon Steel site, and quarterly for the first five years then yearly thereafter (for this proposed project) will be compiled and evaluated by the DEQ and other project personnel for the Sharon steel site and this proposed project.

Under the State of Utah GRAMA rule, this data and other data collected for the proposed project is always available to the public. The DEQ and other project personnel will not be the only group evaluating this data as it develops. The TRC for the Kennecott Southend site, and the "Citizens for a Safe Future for Midvale" TAG group for the Sharon Steel site will be evaluating this data as well.

**1-4:** The project proponents have taken measures to work within the receiving facility's design and operational constraints, by evaluating and balancing the production volumes of concentrate and permeate from the RO facilities. This balancing has been performed to assure the ability to contain and reduce the plumes while managing (appropriately) the waste stream produced after treatment.

### E-mail No. 04-02

**From:** [Craig Buschmann]  
**To:** <nrdtrustee@utah.gov>  
**Date:** Fri, Jul 30, 2004 5:18 PM  
**Subject:** Water Treatment Waste in GSL-member letter

Dear Trustees:

\_\_\_\_\_

As an avid recreationist on the Great Salt Lake I am concerned about the proposal by Kennecott and the Jordan Valley Water Conservancy District (JVWCD) to discharge waste removed by the water purification process into the Great Salt Lake. I request that more appropriate alternatives be analyzed and that permission not be granted to add pollutants to the Great Salt Lake ecosystem.

2-1  
2-2

2-3  
2-4

I am concerned about the preservation of the Great Salt Lake's physical environment, aesthetic appeal, and the long term economic impacts this proposal (and future proposals that might follow such a precedent as this) may have. The Great Salt Lake contributes to my quality of life and I expect that it will contribute much more so to future generations of valley residents as its recreational potential is realized. In the past two years rowing has expanded more than five-fold, from about twenty Great Salt Lake Rowing (GSLR) club members to well over 100 new rowers.[1] Many are teenagers training through four new high school clubs (West, Rowland Hall, Waterford, and Judge),[2] as well as a club at the University of Utah. We expect this rapid growth rate to continue over the next several years as collegiate programs expand throughout the country.[3]

2-5 | As rowers on the Great Salt Lake we come in contact with the water

### Response to E-mail No. 04-02

**2-1:** See the Response to Common Comment No.'s 4 and 5. Also, See the Response to Common Comment No. 7.

**2-2:** See the Response to Common Comment No. 9.

**2-3:** See the Response to Common Comment No. 9.

**2-4:** Under the UPDES (Utah Pollution Discharge Elimination System) permit program, proposed discharges are evaluated for their specific criteria. The UPDES permit is tailored for discharges depending on the waste streams and the body of water in which the discharge is proposed to enter.

### E-mail No. 04-02 (cont.)

2-5 frequently. Beginner rowers often turn over in the lake and some rowers have been known to accidentally swallow mouthfuls of the brine. During regattas we wade into the water to trade boats and some people occasionally swim in the lake, as was once so popular. People are already nervous about the flies on the lake; additional lake contaminants that might keep them away are not needed.

The proposal states that "KUCC proposes to discharge the RO (Reverse Osmosis) concentrate directly to the Great Salt Lake," with further direct discharges "to the Great Salt Lake of the concentrate streams from the Zone A Plant and, if applicable, the Zone B Facilities and Lost Use Facilities," "if for any reason the concentrate stream cannot be managed within the tailings disposal system." [4]

2-1

KUCC acknowledges concerns and suggests that other alternatives may be found if necessary, stating: "If one or both of the concentrates is not suitable for direct discharge, then alternative disposal will be needed." [5] I request that additional alternatives be studied and a more appropriate disposal solution be approved before passing this proposal.

2-5

This concentrated waste includes Selenium which is a bioaccumulate metal [6] that has been shown to travel through food chains and cause deformities, birth defects and death in secondary and tertiary consumers such as birds and humans. (Brine shrimp embryos are collected and sold to aquicultural shellfish farms which are grown for human consumption.) Furthermore, as a person using the Great Salt Lake for recreation, I am concerned about the potential impact these contaminants may have on my health and the health of our children. The National Institutes of Health and

### Response to E-mail No. 04-02 (cont.)

2-5: Selenium has not been shown to cause deformities, birth defects, and death in humans. However, it does have a toxicity effect of wildlife especially avian species in contact with this particular contaminant.

Selenium is an essential trace element for humans. It is an integral part of enzymes, which are critical for control of the numerous chemical reactions involved in the brain and body functions of humans. The NAS has set a Recommended Dietary Allowance (RDA) of approximately 70 and 55 µg/day for North American adult males and females. These selenium requirements increase during pregnancy and lactation. Selenium requirements for infants and children are higher than adults but vary according to age.

Selenium has a variety of functions for humans. The main role is as an antioxidant in the enzyme selenium-glutathione-peroxidase. This enzyme neutralizes hydrogen peroxide, which is produced by some cell processes and would otherwise damage cell membranes. Evidence exists that selenium may play a role in cancer prevention, but better studies are needed. There has even been mixed results regarding selenium's impact on cardiovascular disease.

Although there is not a definable threshold for Selenium toxicity for humans, concentrations that exceed four to five times the maximal levels of mineral supplements have been identified to have a toxic response. Therefore, selenium concentrations in the Great Salt Lake water (as suggested) will not exceed concentrations that would be toxic to humans.

Fish, shellfish, red meat, grains, eggs, chicken, liver and garlic are all good and recommended sources of selenium. The amount of selenium in vegetables is dependent on the selenium content of the soil.

For the concern about toxicity to wildlife, see the Response to Common Comment No. 9.

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- 2-5 the U.S. National Library of Medicine state that while "the amount of selenium that would cause toxicity in humans is not known[,] [e]xcess selenium intake can cause problems with the strength of teeth and the tooth enamel. Other problems may include loss of teeth, hair, and nails. Skin inflammation, nausea  
<http://www.nlm.nih.gov/medlineplus/ency/article/003117.htm>, and fatigue  
<http://www.nlm.nih.gov/medlineplus/ency/article/003088.htm> can also occur." [7] I feel that a prudent public health policy avoids needlessly exposing people, especially developing children and teenagers, to such contaminants. Finally, the Great Salt Lake is a terminal lake basin, which means that inorganic pollutants become ever more concentrated as evaporation occurs and accumulate indefinitely over time. The pollutants introduced to the lake today will be with us forever.
- 2-2

- 2-1 In summary, I request that alternatives be studied which will not degrade the Great Salt Lake environment and that this type of precedent not be set, which might make this amazing environment less popular among residents and tourists, and less productive for wildlife.
- 2-4

Sincerely,

Craig Buschmann

Law Clerk

TraskBritt, P.C.

P.O. Box 2550

**Response to E-mail No. 04-02 (cont.)**

**E-mail No. 04-02 (cont.)**

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[1] GSLR introduced over 80 new rowers to the sport on the National Learn to Row Day in 2003 (the largest number of any club in the nation), and a further 45 new rowers in 2004. Bonneville Rowing Club, also located on the Great Salt Lake, includes even more rowers.

[2] During the spring 2004 racing season, Rowland Hall's club team numbered 16 teenagers, West High School 26, and Waterford 10. Judge High School is starting a program in the fall of 2004; Janet Rae Brooks, Rowers Inaugurate Lake Sprints, The Salt Lake Tribune, May 26, 2004, at

**Response to E-mail 04-02 (cont.)**

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B1. Colorado Junior Crew traveled to Salt Lake City for the Brine Shrimp Sprints, contributing tourism dollars to the state as well as spreading the word about Utah and Utah rowing to family and friends.

[3] Julie Macur, Never Rowed? Take a Free Ride, N.Y. Times, May 28, 2004, at D1.

[4] Kennecott Utah Copper Corp. & Jordan Valley Water Conservancy Dist., 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 17,19 (2004).

[5] Id. at 25.

[6] Steven Angelo, M.D., Selenium in Diet (last modified Jan. 19, 2003) <http://www.nlm.nih.gov/medlineplus/ency/article/002414.htm>.

[7]Id.

**Response to E-mail No. 04-02**

**E-mail No. 04-03**

**From:** [Peter Maier]  
**To:** <nrdtrustee@utah.gov>  
**Date:** Sat, Jul 31, 2004 1:21 PM  
**Subject:** Comments on Southwest Jordan Valley Groundwater Cleanup.

To: NRD Trustee, Utah Department of Environmental Quality.

From: Peter Maier, PhD, PE

Date: July 31, 2004

Comments: Southwest Jordan Valley Groundwater Cleanup Project.

Although the discharge into the Jordan River has been eliminated, there still are some basic questions that in my opinion have not been answered.

Question 1:

3-1

Recent USGS studies indicate the shallow groundwater in the Valley is contaminated. Except for Zone B and Lost Use separated design, the treatment proposal is only filtration and disinfection. In light of the

**Response to E-mail No. 04-03**

**3-1:** The proposed treatment operation for addressing the treatment of feed water derived from the shallow aquifer in Zone B has been evaluated by the DDW and will require the issuance of a drinking water permit from the DDW prior to the delivery of municipal quality water to the public in the Affected Area. This permit requires the development and completion of a pilot study and its evaluation, followed by plan review and approval of the water treatment plant by the DDW to assure the produced water meets the State of Utah's primary and secondary drinking water quality standards. In addition, the system is required to establish protection areas for these sources, using aquifer-specific data, and submit a plan to the DDW that will identify existing potential contamination sources (PCSs) within the protection areas, and propose a mechanism to reduce the risk of contamination from these PCSs. The system is also required to address the possibility of contamination sources that could come into existence in the future, and propose mechanisms to manage possible risks from those sources. DDW believes that the combination of these different programs will enable the system to provide drinking water that meets or exceeds all relevant standards.



**E-mail No. 04-03 (cont.)**

3-1 potential pollutants (as indicated by USGS), the proposed treatment may not be adequate, although (due to incomplete test data) may meet the State's drinking water standards.

Question 2:

While extracting deep and shallow groundwater, this extracted groundwater will be replaced. The question is from what source?

3-2 If it is replaced with the shallow contaminated groundwater, this may cause more problems for the future than this project will solve.

Is the water quality of the replacement water known?

Question 3:

The RO concentrate from Zone A and Zone B/lost use minimum integrated design, is discharged in the KUCC tailing impoundment.

3-3 Along Rd 201 these tailing pond, via drainage pipes, drain into a ditch. I am not familiar with how these ponds operate and where the water in these collection ditch end up, but when they have such these tailing ponds can not be considered 'evaporation' ponds and the question thus is what happens to the pollutants that are dissolved and leave the tailing ponds via these drains?

Is there any data available to the public regarding what happens to dissolved solids in these tailing ponds?

**Response to E-mail No. 04-03 (cont.)**

3-2: See the Response to Common Comment No. 2. As noted during the characterization work, draw downs on the water levels are predicted and necessary to gain containment of the contaminated water in Zone A. Predicted draw down impacts in Zone B are less severe than those in Zone A.

The requirement in the Consent Decree to “remediate the aquifer over the long term” was set for the contaminated water, not water levels. However, the Trustee has worked with the proposing parties to address water level reductions and subsequent impacts to water right owners in the Affected Area. See the Response to Common Comment No. 10.

Reinjection of water was preliminarily investigated during the project characterization work, and may be pursued by the project proponents in the future.

3-3: See the Response to Common Comment No. 7.

**E-mail No. 04-03 (cont.)**

Conclusion:

3-4 | The entire project should be re-evaluated if answers to these essential  
3-5 | questions are not available. In case the recuperation of lost groundwater as  
a drink water source is so important, the Kennecott's money should be spent  
on treating surface water that now flows into the Great Salt Lake and  
Kennecott should be forced to come up with a better solution of the  
problems it has caused.

3-6 | The NRD Trustee, neither The Jordan Valley Water Conservation District  
should have assumed any liabilities caused by Kennecott's groundwater  
contamination. By offering a solution and accepting funds, they also  
became liable and accountable if the proposed solution for the groundwater  
cleanup fails.

Peter Maier, PhD, PE

44 Lakeview

Stansbury, UT 84074

(435) 882-5052

[e-mail address]

CC: Friend of the Great Salt Lake and others.

**Response to E-mail No. 04-03 (cont.)**

3-4: The Trustee believes that questions raised have been adequately  
addressed.

3-5: Comment is noted.

3-6: See the Response to Common Comment No. 12. Also, see paragraph  
IX.K of the 3-Party Agreement. The NRD Trustee does not assume  
liabilities of Kennecott or the District.

**E-mail No. 04-04**

**From:** [SW Regional Office]  
**To:** <nrdtrustee@utah.gov>  
**Date:** Mon, Aug 2, 2004 4:11 PM  
**Subject:** Commenting from Sierra Club on KUCC/JVWCD  
proposal

Dear Dr. Nielson:

Enclosed are the Utah Chapter of the Sierra Club's comments on the KUCC/JVWCD groundwater clean-up proposal. We have included a .doc attachment, as well as pasted it in the text message. Please also note that we are sending these comments to you via U.S. Postal Service.

Thank you,

Utah Chapter of the Sierra Club

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

Dear Dr. Nielson:

Thank you for the opportunity to comment on the Kennecott Utah Copper Corporation (KUCC) and Jordan Valley Water Conservancy District (JVWCD) Proposal for a Groundwater Extraction and Remediation Project in the Southwestern Jordan Valley.

These comments are submitted on behalf of the Utah Chapter of the Sierra

**Response to E-mail No. 04-04**

**E-mail No. 04-04 (cont.)**

Club. The Sierra Club is a national conservation organization, and our approximately 5,000 Utah members have a great interest in the ecological integrity of both the Great Salt Lake and the groundwater in Jordan Valley.

- 4-1 | The Sierra Club believes that the goals of the Project are admirable, and supports the efforts to clean up the aquifer. However, due to the Project's proposals to move the contaminants out of the ground and into the Great Salt Lake and/or the North Tailings Impoundment, we urge the Trustee to consider more peer-reviewed research and science before allowing the construction of any pipelines or other Project infrastructure to take place.
- 4-2 |

The Sierra Club's support for the Project is contingent upon addressing the following concerns related to both the Zone A and Zone B contaminant discharge:

JVWCD Preferred Alternative (Zone B and Lost Use Separate Design)

Selenium Study and Cumulative Impacts

We commend the DEQ for undertaking a two-year study to determine a selenium standard for the Great Salt Lake (GSL). In order for the studies to be scientifically sound, all sources of selenium, its cumulative impacts, and eventual fate in all forms must be thoroughly studied and peer-reviewed.

- 4-3 |
- 1) Look at cumulative discharges of selenium, not just from the Zone B source, but also from Zone A discharges (both directly into the GSL and from the tailings pond) and Kennecott North End selenium discharges, in order to reflect accurately the level of contamination. In addition, total the past, present, and anticipated future amounts of selenium discharge into the GSL.
  - 2) Account for the GSL's low volume levels when setting the selenium

**Response to E-mail No. 04-04 (cont.)**

4-1: See the Response to Common Comment No. 3.

4-2: The comment is noted. See the Response to Common Comment No. 9. Also, see the Response to Common Comment No. 7.

4-3: See the Response to Common Comment No. 9. Concerns No. 1 to 6 will be passed along to the Great Salt Lake Water Quality Steering Committee for assessment.

**E-mail No. 04-04 (cont.)**

standard. A recent High Country News article indicated that the area of the GSL is presently 1200 square miles, while in 1987 it measured 3300 square miles. With such wide fluctuations, the amount of contaminants allowed into the GSL should not be a static number based on high or average GSL levels.

3) Examine synergistic reactions between selenium and other metals or compounds discharged or present in the GSL. Selenium will potentially conspire with other heavy metal precipitates from the Zone A discharge and amplify ecological degradation and GSL toxicity. The effects of these metals need to be studied together, so that the DEQ and others can best monitor, assess, and mitigate their environmental impact.

4-3

4) Consider extending the selenium study period beyond two years to encompass all of the necessary scientific evaluation. Define the selenium analytical methods before the study period begins. To adequately understand the fate of selenium and other heavy metals, the Lake waters and the lake-bottom exposed/dry soils need to be studied independently to account for oxidation, different concentrations of selenium, and the changing hydrology of the Magna Tailings Impoundment.

5) Define the maximum selenium levels permitted in the GSL and use this to define a threshold at which Zone A/Zone B selenium discharge should cease. Discharge of Zone A/Zone B waste should be terminated well before the maximum level is reached to account for selenium entering the GSL from other sources, such as other mines, discarded commercial products, and natural sources. The threshold should be stated as a percentage of the maximum allowable level. From the above evaluations, this percentage should be based on:

- a) The quantities of selenium being released into the GSL by all sources over units of time.
- b) The variations in GSL size and selenium concentrations
- c) The different forms of selenium, including its discharge in the most highly-oxidized form as selenate. Assess the likelihood that it will be converted to selenite, the most

**Response to E-mail No. 04-04 (cont.)**

**4-3, #3:** It will be prudent to evaluate selenium's interaction with other metals, chlorides, sulfides, etc. that are found in the discharge from Zone A and in the open waters of the Great Salt Lake. This study criteria will be passed along to the Great Salt Lake Water Quality Steering Committee for assessment. Please note that one of the intentions of setting up this committee is to evaluate if the proposed action would "amplify ecological degradation and GSL toxicity" and "best monitor, assess and mitigate" problems with this action. UDEQ will plan to look at this issue with an appropriate engineering, chemical, biological and ecotoxicity evaluation.

**4-3, #4:** The DWQ will take the time necessary to evaluate and develop its proposal for the adoption of a selenium standard for the Great Salt Lake, as part of the standards development process. The Great Salt Lake Water Quality Steering Committee will also have a stake in how long this evaluation process will take. As presented during the August 18, 2004 meeting of the Steering Committee, the DEQ believes it is important to gain an understanding on the fate and transport of selenium in the Great Salt Lake. As noted in the general response to comment No. 4-3, these evaluation criteria will be shared with the Steering Committee.

**E-mail No. 04-04 (cont.)**

ecologically dangerous form, and be taken up by plants and animals.

4-3 6) Conduct on-going evaluations of the GSL at regular intervals as the Project progresses to measure selenium levels and re-evaluate the Lake's waste concentrations. When the threshold selenium level is reached, Zone A/Zone B discharge into the Lake should be terminated. When this occurs, a public study of other options for Zone A/Zone B contaminant disposal should occur, based largely on studies and technologies available at that time. We understand that this makes budgeting somewhat imprecise, but new disposal technologies have the potential to reduce costs to KUCC and JWCD.

4-3 Using these methods to set a numeric selenium standard and threshold for the GSL will ensure that KUCC and JWCD take the necessary environmental precautions in disposing of Zone A/Zone B treatment contaminants into the GSL. They also establish a mechanism for the study and implementation of new disposal options when the GSL can no longer safely house contaminants. The Sierra Club's support of this Project is contingent upon using the above methods to conduct the selenium studies that will determine the eligibility of direct Zone B discharge into the GSL, as well as establishing an on-going evaluation process to examine other disposal options.

4-7 While we insist that scientifically-sound studies concerning selenium need to account for synergistic reactions with other substances present in the GSL and KUCC/JWCD discharges, notably the other heavy metals present in Zone A, we urge that this methodology form the basis of establishing standards for all other eco-toxic substances discharged by KUCC and JWCD.

4-8 7) Explain how KUCC and/or JWCD will account for the cost of redundant pipelines and cleaning out scale (clogs). The proposed pipeline to carry the Zone B concentrate to the GSL may require more maintenance and cost more money than is disclosed in this Proposal. Pipeline clogs ("scaling")

**Response to E-mail No. 04-04 (cont.)**

4-4: See the Response to Common Comment No. 9. Please keep in mind, that a UPDES permit is renewed on a five-year cycle. The Division of Water Quality and the permittee evaluate whether a UPDES permit is renewed at the end of five years. The current condition of selenium within the GSL environment is and will be part of this evaluation.

4-5: One of the intentions (held by the Trustee, Kennecott, and the JWCD) is to be able to use the outcome of the selenium evaluation to assist in the determination of how best to manage the treatment concentrates from the Zone B facility. See the Response to Common Comment No. 9.

As noted in the response to comment No. 4-4, a permitted discharge to the GSL will come up for renewal every five years from the date of issuance. The GSL ability to segregate the concentrations of particular contaminants entering via the permitted discharge would be evaluated at the time of renewal.

4-6: As noted in the response to comment No. 4-3, the methods proposed by the Sierra Club to be incorporated into DWQ's and the Great Salt Lake Water Quality Steering Committee's evaluation of selenium will be passed along to this group. The Sierra Club is invited to send a representative of their organization to these meetings to understand the directions and actions being taken by this group.

4-7: It was noted by the ad-hoc group consisting of representatives from DWQ, DERR, the State Trustee, Great Salt Lake Alliance, Nature Conservancy, Wasatch Clean Air Coalition, JWCD, and Kennecott (prior to the creation of the GSL WQ Steering Committee) that other potential contaminants would be evaluated to establish numerical standards prior to their permitted introduction in the GSL environment.

### E-mail No. 04-04 (cont.)

4-8 | are quite common. Redundant pipeline(s) may be necessary to ensure that the flow of concentrates will continue uninterrupted if the primary pipeline should become unusable. The costs of redundant pipeline(s) and of cleaning out scale will be expensive. Is this accounted for in the Project's budget and where will the money come from?

Zone B/Lost Use Integrated Designs

Impoundment Suitability

4-9 | Because the KUCC Magna and North tailings impoundments were not designed as permanent storage facilities for heavy metal precipitates or selenium, we question their suitability as containers for Zone A and Zone B discharge contaminants.

4-3 | 1) The selenium discharge will take the form of selenate. Because this is a highly-oxidized form of selenium, it is unlikely to precipitate out of solution. The tailings impoundments periodically discharge into the GSL, and studies need to be done to assess the impact of selenate on the GSL, even if one of the Integrated Design alternatives is chosen.

4-9 | 2) Study the possible reactions between selenium from Zone B concentrates, from Zone A treatment concentrates, and from other Zone A heavy metals in the tailings impoundment. These have the potential to create a very toxic site that the impoundment was not designed to contain. In addition, how will the periodic discharge of tailings water containing Zone A and Zone B concentrates affect the GSL? How much is expected to be discharged into the tailings ponds and GSL respectively each year? What will be the effects of these metals on the GSL's wildlife? Publish this information for the public to access.

4-10 | 3) Based on the addition of the contaminants from both Zone A and Zone B, we strongly suggest re-opening the tailings impoundment permits to discharge into the GSL. The current permits did not take into account the presence of selenium and other heavy metal precipitates from the contaminated groundwater plumes in the impoundments. In addition, the

### Response to E-mail No. 04-04 (cont.)

4-7 (cont.): The ad-hoc group selected selenium as its first constituent to evaluate because of the present proposal to use the GSL as a receiving water body for the current Joint Proposal before the State Trustee, and because of the concern by members of the public of this substance's introduction into the GSL environment.

4-8: See the Response to Common Comment No. 12.

4-9: See the Response to Common Comment No. 7.

The current UPDES permit on the North Expansion Impoundment recognizes that this facility is appropriate to receive the waste material (including tailings slurry, storm waters, excess mine water flows, etc.) from the mining operation for disposal and periodic discharge to a receiving water body. The RO concentrate produced by both the proposed operations in Zone A and B are associated with the treatment of groundwater impacted by historic mining activities. These RO concentrates are comparable with the material discharged from the mining processing operation.

4-10: As noted in the response to comment No. 4-4, the current UPDES permit for the North Expansion Impoundment is on a five-year review cycle. Under the program the permit does not come up for renewal until Spring 2006. If the results of the GSL WQ Steering Committee work indicates a more restrictive standard for discharges into the GSL for selenium then currently exists in UPDES permits, then DWQ may elect to reopen current permits for re-evaluation.

As noted in the response to comment No. 4-9, the current UPDES permit recognizes this facilities appropriateness to manage mining process waste and RO concentrates. Also refer to Response to Common Comment No. 7 for an understanding of how the Kennecott North Expansion Impoundment was selected to be appropriate to receive concentrates from the proposed treatment alternatives.

**E-mail No. 04-04 (cont.)**

**4-10** | Lake's level has continued to decline since the last issuance and the hydrology of the impoundment has certainly changed more toward the Lake. New permits should reflect these changing conditions.

Future and Additional Costs

**4-11** | Make a plan to ensure the continuous funding of the groundwater clean-up/treatment, scientific studies monitoring the level of pollutants in the GSL, and the examination of future disposal alternatives if the costs exceed the amount allocated in the trust fund. During any 50-year project period, public and private-sector corporate entities will likely undergo several major changes in ownership, governance, mission, structure, and financial viability. The Proposal does not present protections against default by Kennecott, its parent corporation(s), or their respective successor entities as a result of such changes. We recommend that a surety be established whereby, in the event of default, continued funding will be guaranteed at 100 percent of Kennecott's original commitment for the 50-year project duration. The conditions of the surety should be established to ensure that there is no disruption in project funding due to litigation or other problems.

**4-12** | There is no protection against default by the JWCD for any reason, such as restructuring by the State of Utah. We recommend explicit legal protections that will ensure that JWCD's commitment will survive any restructuring or change in the scope, role, or mission of JWCD, even if that would mean that responsibility for this commitment may be assumed directly by the State of Utah.

Formulate a plan for ensuring the responsibility of payment of unanticipated future costs, such as are likely to occur should dumping into the GSL cease to be an option. .

Monitoring of Drinking Water

Guarantee that fail-safes are in order to ensure that the stream of RO treated water from Zone B going to the public is drinkable. How are JWCD and the DWQ planning to monitor the effectiveness of reverse osmosis on this

**Response to E-mail No. 04-04 (cont.)**

**4-11:** See the Response to Common Comment No. 12.

The DWQ is addressing the development of numerical standards for the particular contaminants to protect the beneficial uses of the GSL. This evaluation work is being funded by DWQ through mechanisms arranged by the division.

The re-evaluation of disposal practices (if a UPDES permit is not renewed or approved) falls to the proposing parties.

**4-12:** See the Response to Common Comment No. 12.



### **E-mail No. 04-04 (cont.)**

large-scale process? We suggest that the Proposal include an explicit, detailed plan for preventing contamination from entering the potable water supply, in the event the reverse osmosis system should fail at any time and for any reason during the 50-year project. The plan should include provision for ongoing, continual monitoring of water quality and immediate detection of, and immediate preventive measures against, any contaminants. Current monthly and historical monitoring reports, including maximum levels of contaminants during the respective reporting periods, should be available on the Department of Environmental Quality's web site (or the logical technical successor to web site technology) for the duration of the project.

#### Integrity of the Aquifer

Re-evaluate the groundwater modeling used in the Consent Decree. We are concerned that the rate of recharge has been overestimated. Based on our current drought conditions, we do not want excess water to be taken from the aquifer to meet the quota determined in the Consent Decree if this is currently unsustainable.

#### Additional Concerns and Points of Clarification

1. Table 5.6B, and Section 8.2 mention an "alternative disposal method" if concentrates are unsuitable for direct discharge into GSL. What would be an example of a safe disposal method?
2. Section 6.1 says that the "flow and transport models were extensively reviewed" by several government agencies and other "international and nationally-recognized reviewers." While peer reviews are an essential part of projects like this, the statement implies that all the reviewers agreed. Is this the case, or were changes in procedures suggested? If so, were these suggested changes implemented?

4-13

3. Section 6.3 states "Modeling of the additional extraction from Zone B proposed under the Integrated design results in negligible drawdown."

### **Response to E-mail No. 04-04 (cont.)**

**4-13:** See the Response to Common Comment No. 6.

**E-mail No. 04-04 (cont.)**

- 4-13 | Since the word negligible can mean many things, depending on your point of view, we suggest a specific number be used here.
- 4-14 | 4. Section 7.2 says "The water rights listed in Table 7.2C have been approved by the State Engineer." However, Table 7.2C lists these as "Approved and Pending."
- 4-15 | 5. Section 7.3 says that "KUCC is committed to assist property owners affected by KUCC remediation efforts in obtaining an adequate water supply" by several methods including financial support. Is this commitment stated in a legal contract? If not, why not?
- 4-2 | Based on all of the above concerns, we strongly suggest that construction of the Separate Design pipeline not be started until the selenium standard is evaluated, so as not to predetermine the alternative that is chosen. In addition, we understand that pumping must be done to prevent underground contamination spread, but ask the Trustee to allow only the minimum amount of pumping necessary, until the appropriate scientific studies have been done, future projections of population growth taken into account, and the integration of this Proposal with the State Engineers' Water Management Plan.
- 4-16 |
- 4-1 and 4-3 | Provided these recommendations are incorporated into Project implementations, the Utah Chapter of the Sierra Club lends its support to the Project.

Sincerely,

Ann Wechsler  
Conservation Chair, Utah Chapter of the Sierra Club

**Response to E-mail No. 04-04 (cont.)**

4-14: Section 7.2 does recognize accurately that the water rights for this particular project have been approved for the proposed project. What is noted in table 7.2C is the need to potentially increase extraction rates on the deep extraction wells (No. B1-7) if the JWCD is not able to pursue a discharge under a UPDES permit to the GSL, and if the JWCD selects to pursue the full integrated design. The production design options are refer to in Response to Common Comment No. 6.

4-15: See the Response to Common Comment No. 10.

4-16: One of the main goals or objectives of the Trustee's action to address the contaminant plumes is to provide containment of the plumes and begin reducing their footprint. This reduction will assist the Trustee to assure the aquifer is remediated, so it can be used as a source of drinking water without having to pretreat the water to address the impacts from historic mining activities. Zone A has been pumped for some time, (1) to meet the requirement of the Consent Decree related to the stipulated extractions on the acid plume and (2) to provide water to KUCC process water circuit under approved and historical water rights. No extractions have taken place yet in Zone B, relating to the removal of sulfate-laden groundwater from the deep aquifer.

The proposed extractions rate for Zone A and completion of the Zone A RO facility by Kennecott is scheduled to be as early as 2005. The proposed extraction rates for Zone B will not be decided upon until the JWCD renders a decision on flow options, as described in the Response to Common Comment No. 6.

**E-mail No. 04-05**

**From:** [Dudley Ward]  
**To:** <nrdtrustee@utah.gov>  
**Date:** Mon, Aug 2, 2004 5:21 PM  
**Subject:** FW: Public Submission for IWS Proposal for the Southwest Jordan Valley Groundwater Remediation Project.

#####

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#####

Dudley Ward  
Ph +64, 9, 5753624  
Fx +64, 9, 5753623

-----Original Message-----

From: Dudley Ward [mailto:[e-mail address]]  
Sent: Tuesday, 3 August 2004 11:18  
To: Dianne R Nielson  
Subject: FW: Public Submission for IWS Proposal for the

**Response to E-mail No. 04-05**

\* The Trustee acknowledges the receipt of the proposal from Mr. Ward for an alternative treatment process and has passed the information along to the proposing parties. Under the terms of the Consent Decree, Kennecott has the responsibility to propose the treatment method for review and consideration by the Trustee if they wish to receive a reduction of the letter of credit. The proposal by Kennecott and the Jordan Valley Water Conservancy District to use reverse osmosis to treat sulfate contaminated water from Zone A and B was the subject of both sessions of the public comment period, and the Trustee's evaluation.

The comment memo from Mr. Dudley is included and responded to below.

**E-mail No. 04-05 (cont.)**

Southwest Jordan  
Valley Groundwater Remediation Project.

August 02/04, 1645hrs UTAH Time.

Attention Dianne Nielson - Trustee.

Subject Attachments Herewith.

My server will not recognise 'nrtrustee.utah.gov' as a legitimate email address.

Please accept my sending this email direct to you. Thank you in anticipation.

With Regards,

#####

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**Response to E-mail No. 04-05 (cont.)**

**E-mail No. 04-05 (cont.)**

Dudley Ward  
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Fx +64, 9, 5753623

---

Outgoing mail is certified Virus Free. Checked by AVG anti-virus system (<http://www.grisoft.com>). Version: 6.0.726 / Virus Database: 481 - Release Date: 22/07/2004

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Outgoing mail is certified Virus Free. Checked by AVG anti-virus system (<http://www.grisoft.com>).  
Version: 6.0.726 / Virus Database: 481 - Release Date: 22/07/2004

**Response to E-mail No. 04-05 (cont.)**

**E-mail No. 04-05 (attached memorandum)**

August 2, 2004

Dianne Nielsen, Trustee & Director,  
Utah State Department of Environmental Quality

Subject – Comments on proposal revisions of Kennecott/Jordan Valley Water Conservancy District Joint Proposal for the Southwest Valley Groundwater Cleanup Project

Dear Ms. Nielsen,

This letter is in comment to the revised Joint Proposal of Kennecott/Jordan Valley Water Conservancy District for the Southwest Valley Groundwater Cleanup Project. IWS has made public comment on the revised joint proposal in the public meeting on July 14, 2004. Since that time, IWS has further reviewed the proposal and has the following additional comments and submissions to be included in the public record.

- 5-1 1. Figures 5.4B, 5.4C, and 5.4D indicate that the permeate from the reverse osmosis plant will have a TDS concentration of 25 mg/l. No pilot studies have been conducted to verify that such a low TDS concentration can be achieved and what the operational cost will be. The proposed treatment process remains untested and untried.
- 5-2 2. This fact places the IWS proposed distillation process and technology on the same or a higher plane than proposed revised proposal RO process. The distillation machine IWS proposes to use is tried and true in producing less than 10 mg/l permeate.
- 5-3 3. IWS made a proposal to the JWCD for providing zero liquid discharge (ZLD) treatment of the RO waste stream for the Southwest Jordan Valley Groundwater Cleanup Project which is enclosed herewith and is

**Response to E-mail No. 04-05 (attached memorandum)**

**5-1:** Both Kennecott and the JWCD have been working cooperatively with the Division of Drinking Water to assess the ability of the treatment plants to function as proposed and produce a municipal quality drinking water (meeting state primary and secondary drinking water standards). This review and assessment has included the submittal of Kennecott Remediation Zone B Pilot Test Report and the Kennecott Zone A Demonstration Project Report to the Division. The Division of Drinking Water has the responsibility to assess proposals for and then issue a permit for the production and delivery of municipal quality drinking water to the citizens of the State of Utah.

Also, please see Response to Common Comment No. 13.

**5-2:** Pilot scale treatment skids for both Zone A and B have been in place and treating waters from the respective zones for some time. The ability for the proposed RO processes to reach a certain concentration of TDS has been documented in the pilot studies submitted to the Division of Drinking Water. Performance of Reverse Osmosis membrane technology has been demonstrated in two reports by the Environmental Technology Verification program. The reports verified performance of Reverse Osmosis Technology for Arsenic Removal, achieving solids rejection exceeding 95%. The EPA proposed Long Term 2 Enhanced Surface Water Treatment Rule contains a Membrane Filtration Guidance Manual, including reverse osmosis technology. Reverse Osmosis has been a tested and tried technology used on similar sulfate contaminated waters found in Zone A and B. The Division of Drinking Water is reviewing the ability for the proposed treatment facilities to meet the State of Utah primary and secondary drinking water standards. Please note that the State primary drinking water standard for TDS is 1000 mg/l and the secondary drinking water standard for TDS is 500 mg/l.

**5-3:** See the bulleted response provided to the body of the text of the cover e-mail.

**E-mail No. 04-05 (attached memorandum, cont.)**

5-3 | requested to be made a part of the public record.

5-4 | 4. The cost of the IWS V-Still E-500 machine is 10 times less than the cost of other distillation processes evaluated by the JWCD and the stakeholders forum and can be housed in an aesthetically pleasing building or aesthetically pleasing individual housings.

5-5 | 6. The IWS proposal to the JWCD includes processing of the salts and minerals in the water into marketable and usable products thereby eliminating the need for the wastewater discharge pipeline to the Great Salt Lake and the need to discharge selenium into the lake.

5-6 | 7. Though IWS proposal includes proprietary technology, the IWS proposal represents a legitimate proposed privatisation water/wastewater project which can be implemented jointly with the JWCD pursuant to Utah Code Ann. 73-10d which waives both state and local agency competitive bidding requirements to facilitate just such a joint project as the IWS proposes.

5-7 | 8. The attached proposal is just that. It is a proposal that IWS stands behind, but IWS remains flexible regarding potential contractual arrangements and would welcome constructive negotiations on how IWS can assist the Trustee and the DEQ, Kennecott, and the JWCD in moving forward with the best possible project.

In summary, because the joint proposal RO process for producing 25 mg/l permeate remains untried and untested, the IWS proposal is as viable if not more viable than the proposed RO process proposal and is entitled to be considered. Thus, IWS requests that:

- 5-8 |
- (1) the IWS V-still machines be tested along with the RO technology; and
  - (2) IWS be granted the legal protection it needs to share its proprietary technology with the DEQ, Kennecott, and the JWCD, and participate with them in a privatisation project

**Response to E-mail No. 04-05 (attached memorandum, cont.)**

5-4: Comment is noted and passed along to the proposing parties for consideration.

5-5: Comment is noted and passed along to the proposing parties for consideration.

5-6: Comment is noted and passed along to the proposing parties for consideration.

5-7: Comment is noted.

5-8: See the response provided above for Comment No. 5-1 and 5-2. RO technology has been shown to be an appropriate technology to treat sulphate contaminated water, to produce municipal quality water. The stated request will be provided to the proposing parties for consideration.

**E-mail No. 04-05 (attached memorandum, cont.)**

5-8

that will eliminate the need to discharge reject wastewater and selenium into the Great Salt Lake.

5-9

We are confident that as Trustee of the most valuable and scarce resource in Utah, you will be acutely aware that the JWCD has an obligation to current and future water users to explore emerging technologies in order to conserve deep and shallow aquifer water and minimise or eliminate mineral discharge into the GSL.

With Regards,

Dudley E J Ward.  
IWS/Equus Environmental

Attachments –

April 14<sup>th</sup>, 2004 - Overview of IWS Proposal to the JWCD.

April 7<sup>th</sup>, 2004 - IWS Proposal to the JWCD.

May 17<sup>th</sup>, 2004 - IWS Supplement to the April 7<sup>th</sup>, 2004 IWS Proposal to the JWCD.

June 7<sup>th</sup>, 2004 - IWS follow up letter to the JWCD Chief Executive & Chairman.

**Response to E-mail No. 04-05 (attached memorandum, cont.)**

**5-9:** The proposal is for use of RO technology to treat the groundwater in Zone A and B and produce municipal quality water. The continued investigation of alternative treatment technologies as they arise, is not prevented by the Trustee’s decision on the current proposal. The proposal by IWS has been passed along to the proposing parties for their consideration.

The Trustee notes that the introduction of minerals into the Great Salt Lake environment has and will continue to be managed by the Division of Water Quality under its permit programs (UPDES, Groundwater Protection Program). It is under the Division’s authority to maintain the beneficial uses of the lake. To this end the DWQ, Kennecott, JWCD and the Trustee all have acknowledge the need to develop numerical standards for the open waters of the Great Salt Lake. The wetlands and rivers that surround and enter the Great Salt Lake are protected by current State freshwater numerical standards to maintain the beneficial uses of these water bodies. As the Great Salt Lake Water Quality Steering Committee continues to pursue the investigation of the fate and transport of contaminants within the GSL environment the DWQ will develop and propose numerical standards for the open waters, to include selenium. See also the Response to Common Comment No. 9.



**E-mail 04-06**

**From:** [Gavin Noyes]  
**To:** <nrdtrustee@utah.gov>  
**Date:** Mon, Aug 2, 2004 7:42 PM  
**Subject:** Water Purification Proposal

July 31, 2004

Diane Nielson, Executive Director

Utah Department of Environmental Quality

P.O. Box 144810

Salt Lake City, UT

84114-4810

Dear Ms. Nielson,

As an avid recreationist on the Great Salt Lake I am concerned about the proposal by Kennecott and the Jordan Valley Water Conservancy District (JVWCD) to discharge waste removed by the water purification process into the Great Salt Lake. I request that more appropriate alternatives be analyzed and that permission not be granted to add pollutants to the Great Salt Lake ecosystem.

6-1  
6-2

6-3  
6-4

I am concerned about the preservation of the Great Salt Lake's physical environment, aesthetic appeal, and the long-term economic impacts this proposal (and future proposals that might follow such a precedent as this) may have. The Great Salt Lake contributes to my quality of life and I expect

**Response to E-mail No. 04-06**

**6-1:** See the Response to Common Comment No.'s 4 and 5. Also, see the Response to Common Comment No. 7.

**6-2:** See the Response to Common Comment No. 9.

**6-3:** See the Response to Common Comment No. 9.

**6-4:** Under the UPDES (Utah Pollution Discharge Elimination System) permit program, proposed discharges are evaluated for their specific criteria. The UPDES permit is tailored for discharges depending on the waste streams and the body of water in which the discharge is proposed to enter.

### E-mail No. 04-06 (cont.)

that it will contribute much more so to future generations of valley residents as its recreational potential is realized. In the past two years rowing has expanded more than five-fold, from about twenty Great Salt Lake Rowing (GSLR) club members to well over 100 new rowers.[1] Many are teenagers training through four new high school clubs (West, Rowland Hall, Waterford, and Judge),[2] as well as a club at the University of Utah. We expect this rapid growth rate to continue over the next several years as collegiate programs expand throughout the country.[3]

6-5

As rowers on the Great Salt Lake we come in contact with the water frequently. Beginner rowers often turn over in the lake and some rowers have been known to accidentally swallow mouthfuls of the brine. During regattas we wade into the water to trade boats and some people occasionally swim in the lake, as was once so popular. People are already nervous about the flies on the lake; additional lake contaminants that might keep them away are not needed.

6-1

The proposal states that "KUCC proposes to discharge the RO (Reverse Osmosis) concentrate directly to the Great Salt Lake," with further direct discharges "to the Great Salt Lake of the concentrate streams from the Zone A Plant and, if applicable, the Zone B Facilities and Lost Use Facilities," "if for any reason the concentrate stream cannot be managed within the tailings disposal system." [4]

KUCC acknowledges concerns and suggests that other alternatives may be found if necessary, stating: "If one or both of the concentrates is not suitable for direct discharge, then alternative disposal will be needed." [5] I request that additional alternatives be studied and a more appropriate disposal

### Response to E-mail No. 04-06 (cont.)

**6-5:** Selenium has not been shown to cause deformities, birth defects, and death in humans. However, it does have a toxicity effect of wildlife especially avian species in contact with this particular contaminant.

Selenium is an essential trace element for humans. It is an integral part of enzymes, which are critical for control of the numerous chemical reactions involved in the brain and body functions of humans. The NAS has set a Recommended Dietary Allowance (RDA) of approximately 70 and 55 µg/day for North American adult males and females. These selenium requirements increase during pregnancy and lactation. Selenium requirements for infants and children are higher than adults but vary according to age.

Selenium has a variety of functions for humans. The main role is as an antioxidant in the enzyme selenium-glutathione-peroxidase. This enzyme neutralizes hydrogen peroxide, which is produced by some cell processes and would otherwise damage cell membranes. Evidence exists that selenium may play a role in cancer prevention, but better studies are needed. There has even been mixed results regarding selenium's impact on cardiovascular disease.

Although there is not a definable threshold for Selenium toxicity for humans, concentrations that exceed four to five times the maximal levels of mineral supplements have been identified to have a toxic response. Therefore, selenium concentrations in the Great Salt Lake water (as suggested) will not exceed concentrations that would be toxic to humans.

Fish, shellfish, red meat, grains, eggs, chicken, liver and garlic are all good and recommended sources of selenium. The amount of selenium in vegetables is dependent on the selenium content of the soil.

For the concern about toxicity to wildlife, see the Response to Common Comment No. 9.

**E-mail No. 04-06 (cont.)**

6-1 | solution be approved before passing this proposal.

6-5 | This concentrated waste includes Selenium, which is a bioaccumulate metal[6] that has been shown to travel through food chains and cause deformities, birth defects and death in secondary and tertiary consumers such as birds and humans. (Brine shrimp embryos are collected and sold to aquicultural shellfish farms, which are grown for human consumption.) Furthermore, as a person using the Great Salt Lake for recreation, I am concerned about the potential impact these contaminants may have on my health and the health of our children. The National Institutes of Health and the U.S. National Library of Medicine state that while "the amount of selenium that would cause toxicity in humans is not known [,] [e] xcess selenium intake can cause problems with the strength of teeth and the tooth enamel. Other problems may include loss of teeth, hair, and nails. Skin inflammation,

6-2 | <http://www.nlm.nih.gov/medlineplus/ency/article/003117.htm> nausea, and <http://www.nlm.nih.gov/medlineplus/ency/article/003088.htm> fatigue can also occur."[7] I feel that a prudent public health policy avoids needlessly exposing people, especially developing children and teenagers, to such

6-6 | contaminants. Finally, the Great Salt Lake is a terminal lake basin, which means that inorganic pollutants become ever more concentrated as evaporation occurs and accumulate indefinitely over time. The pollutants introduced to the lake today will be with us forever. If the DEQ decides to

6-6 | consider this decision as proposed, please include a complete long-term environmental analysis on the effects this might have on the Great Salt Lake environment, as well as the economic ramifications in terms of recreation, shrimping and salt industries, and tourism on the state's economy.

6-1 | In summary, I request that alternatives be studied which will not degrade the Great Salt Lake environment and that this type of precedent not be set, which might make this amazing environment less popular among residents and tourists, and less productive for wildlife.

6-4 |

**Response to E-mail No. 04-06 (cont.)**

6-6: See the Response to Common Comment No. 9.

**E-mail No. 04-06 (cont.)**

Sincerely,

Gavin Noyes

309 N Almond Street

Salt Lake City, UT 84103

(801) 521-7398

[1] GSLR introduced over 80 new rowers to the sport on the National Learn to Row Day in 2003 (the largest number of any club in the nation), and a further 45 new rowers in 2004. Bonneville Rowing Club, also located on the Great Salt Lake, includes even more rowers.

[1] During the spring 2004 racing season, Rowland Hall's club team numbered 16 teenagers, West High School 26, and Waterford 10. Judge High School is starting a program in the fall of 2004; Janet Rae Brooks, Rowers Inaugurate Lake Sprints, The Salt Lake Tribune, May 26, 2004, at B1. Colorado Junior Crew traveled to Salt Lake City for the Brine Shrimp Sprints, contributing tourism dollars to the state as well as spreading the word about Utah and Utah rowing to family and friends.

[1] Julie Macur, Never Rowed? Take a Free Ride, N.Y. Times, May 28, 2004, at D1.

**Response to E-mail No. 04-06 (cont.)**

**E-mail No. 04-06 (cont.)**

\_\_\_\_\_

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[3] Julie Macur, Never Rowed? Take a Free Ride, N.Y. Times, May 28, 2004, at D1.

[4] Kennecott Utah Copper Corp. & Jordan Valley Water Conservancy Dist., 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 17,19 (2004).

[5] Id. at 25.

[6] Steven Angelo, M.D., Selenium in Diet (last modified Jan. 19, 2003) <http://www.nlm.nih.gov/medlineplus/ency/article/002414.htm>.

[7]Id.

**Response to E-mail No. 04-06 (cont.)**

**E-mail No. 04-07**

**From:** [jeffsalt]  
**To:** <nrdtrustee@utah.gov>  
**Date:** Mon, Aug 2, 2004 11:56 PM  
**Subject:** Comments to revised NRD plans

Dianne,  
Attached are comments from Jeff Salt, Great Salt Lakekeeper.

**Response to E-mail No. 04-07**

**E-mail No. 04-07 (attached letter)**

Jeff Salt

August 2, 2004

Great Salt Lakekeeper Inc.  
P.O. Box 522220  
Salt Lake City, Utah 84152  
(801) 485-2550  
[e-mail address]

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

Re: Comments to June 2004 proposed revision to Southwest Jordan Valley  
Groundwater Cleanup Plan

Dear Dianne,

On behalf of Great Salt Lakekeeper Inc., a Utah nonprofit corporation, I am  
submitting the following comments regarding the proposed revision to the  
Southwest Jordan Valley Groundwater Cleanup Plan.

**I. Preface to comments on revised cleanup proposals**

7-1

The Great Salt Lake is a globally significant natural resource and should be  
considered as such when approving the final details of the proposed cleanup  
plan. The importance of Great Salt Lake to local economies and migratory  
wildlife populations is due not only to the existence of the lake itself, but  
also hinges on the proper functioning condition and health of its extensive  
tributary system, which describes the entire watershed.

7-2

That stated, my organization believes that the affected groundwater resource  
can be characterized as damage to a significant component of the Great Salt  
Lake watershed system, and that any approvals issued for cleanup plans

**Response to E-mail No. 04-07 (attached letter)**

**7-1:** The Trustee, Kennecott and the JWCD all recognize the importance  
of the Great Salt Lake, its associated wetlands and the value this resource  
holds for all the citizens of the State of Utah. See the Response to Common  
Comment No. 9.

**7-2:** Comment is noted; see the Response to Common Comment No. 9.  
Criteria suggested for the development of numerical standards work will be  
passed along to the Great Salt Lake Water Quality Steering Committee.

### E-mail 04-07 (attached letter, cont.)

7-2 | should be decided within a whole watershed context. In our opinion, this means that all impacts to the proper functioning and protected beneficial uses of the Jordan River drainage basin and the lake itself must be considered fully, and that various human and wildlife and even aesthetic values must be protected and made whole without compromise or transfer of impacts simply to reach an efficient or economically feasible procedure.

7-3 | All Utahns should expect this high standard because of existing federal and state laws that guarantee the public's right to these protected values and beneficial uses. Besides the various laws and regulations that protect our water resources and outline responsibilities of polluters to clean up their messes, we would like to draw your attention to the unique status of both the Jordan River and the Great Salt Lake as designated *navigable and sovereign waterways* (Utah Administrative Code R652-70-100). This special designation adds another layer of responsibility; not only to the project partners, but also to you as Trustee, to guarantee the integrity of the public trust resources throughout the life of the cleanup project. Accordingly,

*“The state of Utah recognizes and declares that the beds of navigable waters within the state are owned by the state..., and that there exists..., a public trust over and upon the beds of these waters ...beneath or above the beds of navigable (waters)...be regulated...(for) the protection of navigation, fish and wildlife habitat...public recreation, and water quality...”*

(Utah Administrative Code R652-2-200).

We support the position of other conservation organizations that have submitted comments focusing on the potential impacts of this cleanup plan on water quality in Great Salt Lake and to wildlife. We consider these public trust resources as valuable community assets that should not be compromised in value by implementation of the cleanup plan.

### **II. Comments to cleanup plan alternatives**

### Response to E-mail No. 04-07 (attached letter, cont.)

7-3: See the Response to Common Comment No's 8 and 9.



**E-mail No. 04-07 (attached letter, cont.)**

7-4 Generally speaking, we applaud the JVVCD's response to overwhelming public opposition to and subsequent withdrawal of their UPDES discharge permit for ZoneB/ Lost-Use process effluent into the Jordan River. We supported the creation of a public stakeholder's forum to explore different approaches. However, after careful review of the proposed alternatives, we have determined that none of the revised protocols satisfactorily protect existing public trust resources from new or increased impacts. In our opinion, each scenario relies on intentional discharges into the Great Salt Lake of contaminated concentrates from the ZoneB/ Lost-Use sources and allows for the potential discharge of RO brines from Zone A. In a broad sense, the alternatives forwarded for public comment do not constitute a *cleanup* or *removal* or *restoration* as called for in CERCLA. Instead, the alternatives presented basically provide for the shifting of pollutants and contaminants from one part of the watershed to another. Furthermore, the proposed alternatives also create potential additional risks to public trust resources protected by law and desired by the community. And lastly, we believe that some of the proposed alternatives establish extra benefits for the JVVCD that are not allowed by the intent of CERCLA or the Consent Decree.

7-5

*A. Concerning discharges to 'navigable and sovereign waterways'*

7-5 As we understand the proposed alternatives, RO process effluent from Zone B/Lost-Use waters will either be discharged directly to the Great Salt Lake, or released into the lake after being held and possibly recycled from the Kennecott Tailings Impoundment, and that Zone A effluent may also eventually be discharged into the lake. We object to these options because they allow for the concentration and spreading of contaminants on publicly owned land, that is, the bed of Great Salt Lake. In our opinion, this approach does not constitute a cleanup and is contradictory to CERCLA regulations and conflicts with the rules regarding the management objectives for sovereign lands.

7-6 More specifically, we reject the *Separate Design* alternative completely because of its reliance on direct discharges to Gilbert Bay in Great Salt Lake. This alternative cannot be approved at this time, because qualified numeric standards for Great Salt Lake need to first be established for the

**Response to E-mail No. 04-07 (attached letter, cont.)**

7-4: See the Response to Common Comment No. 8.

7-5: See the Response to Common Comment No. 6 and No. 9.

7-6: See the Response to Common Comment No. 6 and No. 9.

**E-mail No. 04-07 (attached letter, cont.)**

- 7-6 | anticipated effluent contaminants such as, selenium, mercury, copper,  
7-7 | chromium, iron, and total dissolved solids. We recommend, as Trustee, that  
you delay your approval until sufficient time is given to conduct a science-  
based process to determine qualified numeric standards for the lake system.  
While we fully support JWCD's commitment to conduct a selenium study  
for Great Salt Lake, we must question the appropriateness of the proposed  
timeframe to conduct that study. Given the unique complexity of the lake's  
chemistry, it seems unrealistic to expect that qualified numeric standards  
can be established within a two-year period. A more realistic estimate  
7-8 | might be three to five years, given the time required to secure funding, to  
form a steering committee and science group, to establish agreeable study  
parameters and protocols, to collect reliable and meaningful data, and to  
derive the final numeric standards. In addition, impacts to sovereign lands  
caused by depositing contaminants on the lakebed will need to be studied  
and addressed.
- 7-9 | Both of the Integrated Designs must be challenged because of their reliance  
on discharging concentrated contaminants to a *navigable and sovereign*  
*waterway*. Even though we support the Minimum Integrated Design over  
the other proposed alternatives, both Integrated proposals are unacceptable  
because they allow for the discharge of contaminated concentrates into  
Great Salt Lake directly or secondarily from the Kennecott Tailings  
Impoundment through use of Kennecott's current UPDES discharge permit.  
The possibility of discharging concentrates from the Tailings Impoundment  
has not been adequately illustrated in the schematic flow charts provided in  
the June 2004 Report. Approval of either Integrated Designs should also be  
7-7 | delayed until an adequate contaminant study can be conducted for Great  
Salt Lake, both in terms of impacts to water quality and sovereign lands.
- B. Potential new or increased impacts to public trust resources*
- 7-10 | As stated above, we support the proposed Minimum Integrated Design over  
the other alternatives given. However, each alternative forwarded for public  
review allows for potential new impacts to public trust resources, which  
conflicts with the intent of CERCLA.
- 7-11 | The Jordan River is a constantly gaining waterway that relies on

**Response to E-mail No. 04-07 (attached letter, cont.)**

7-7: The Trustee's approval of the project does acknowledge the need to investigate and appropriately select a disposal option for the RO concentrate from the Zone B facility. The Trustee has the flexibility to approve this project with the understanding that the disposal option will be selected after the appropriate information pertaining to selenium and transport in the Great Salt Lake environment is developed.

Also, see the Response to Common Comment No. 9.

7-8: See the response to Common Comment No. 6 and No. 9.

Please note that the JWCD has acknowledged that their selection of a disposal option will be based upon the information known at the time of a permit application. If there is still a lack of understanding on the fate and transport of selenium within the Great Salt Lake environment, the District has stated they will look to utilize the Kennecott North Expansion Impoundment as the disposal point for Zone B RO concentrates. Also, see the Response to Common Comment No. 7.

7-9: See the Response to Common Comment No. 7.

7-10: See the Response to Common Comment No. 9 and No. 13.

**E-mail No. 04-07 (attached letter, cont.)**

- 7-11 groundwater accretion from the shallow aquifer to maintain instream flows. Several potential impacts would be caused by the proposed removal of shallow groundwater in Zone B near the Jordan River. Depletion of instream flows would seriously impact water quality, fish and wildlife habitat, and recreational boating opportunities in the Jordan River. My organization has been working on a recreational boating master plan for the Jordan River since 2002. Because of its *navigable* status, recreational boating on the Jordan River should be considered a primary public trust value at risk from the proposed cleanup alternatives. We believe that all three proposals will negatively impact the future development of recreational boating opportunities on the Jordan River, and that the Separate Design creates the greatest impact to this use.
- 7-11
- 7-5 We also believe that recreational use of the Great Salt Lake will be further impacted by the discharge of concentrates into the lake. Currently, local use of the south shores for swimming is very limited due to fears of contact with contamination from Kennecott discharges. Tourists seem to be the only people that swim in the lake any more, because they don't know about current or anticipated discharges. We believe that additional discharges into the lake will reduce the already limited recreational swimming use at the south shores.
- 7-5 Additional potential impacts connected to the proposed alternatives include the loss of wetlands and damage to federally funded restoration projects along the Jordan River corridor. Currently, the JVVCD is conducting a wetlands impact study related to withdrawal of shallow groundwater from the Jordan River system. Those results have not yet been published or agreed upon by the stakeholder group, and should be considered by you as Trustee before making a final determination. This provides another justification for delaying your final approval of any proposed cleanup alternatives.
- 7-10 Of the three alternatives, we believe the Minimum Integrated Design causes the least impact to the groundwater recharge regime of the Jordan River, and therefore would cause the least additional harm to existing resource values.

**Response to E-mail No. 04-07 (attached letter, cont.)**

7-11: The depletion of instream flows of nearby water bodies, is part of the application review process of the Division of Water Rights when approached by an entity proposing to develop a particular water right within the Salt Lake Valley. The Division review follows the guidelines stated within the Salt Lake Valley Groundwater Management Plan. All water rights for this particular project are required to be approved by the State Engineer.

**E-mail No. 04-07 (attached letter, cont.)**

*C. Possible extra benefits to project proponents*

7-12 Under the terms set forth in the Consent Decree and CERCLA regulations, project proponents are not to receive extra benefits from the cleanup plan. Under each proposal, the JWCD will reap extra benefits in terms of development of infrastructure to extract, process and deliver shallow aquifer water for anticipated future M & I development plans. In the near future, and during the life of the cleanup project, JWCD plans to drill more than 300 additional wells to access groundwater from the shallow aquifer. Though always discussed as separate projects, the cleanup plan actually creates advantages for the Water District's Shallow Wells program in terms of cost, shared infrastructure and permitting, which is arguably not in keeping with the intent of the Consent Decree or CERCLA. We recommend that an alternative be approved that creates a definitive separation between the cleanup plan and future water development plans by the JWCD.

**III. Summary of comments**

7-5 In summary, Great Salt Lakekeeper Inc. does not support any of the three cleanup alternatives proposed in the June 2004 *Report to the Public*. We reject the Separate Design completely and can only mildly support the Minimum Integrated Design alternative. We further recommend that you  
7-7 delay your final approval of any alternative until the completion of the selenium study is completed and agreed upon by all stakeholders, and until such time that qualified numeric standards can be established for selenium and a related suite of contaminants including mercury, copper, chromium, iron and TDS.

7-7 In addition to our recommendation for delaying approval, we request that you consider making any approval conditional or provisional in order to allow for the collection and assessment of relative data and the outcome of public review processes. We also encourage you to make provisions for adequate consideration and testing of new technologies that can achieve cleanup goals and eliminate secondary or new impacts to the Great Salt Lake watershed system.

7-13 And finally, we believe that cost should not be ultimate deciding factor in

**Response to E-mail No. 04-07 (attached letter, cont.)**

7-12: The referenced development of shallow groundwater resources by the JWCD are beyond the scope of the Trustee's consideration with the current NRD proposed project. The JWCD's ability to enlarge their extraction program of the shallow aquifer is within the jurisdiction of the State Engineer.

7-13: See the Response to Common Comment No. 12.

**E-mail No. 04-07 (attached letter, cont.)**

7-13 | choosing a final alternative. Given that the court has determined dollar amounts for this plan, we feel that polluters should bear the full costs of cleanups, without causing additional impacts or social costs to the public.

Thank you for allowing the public to comment on this phase of the cleanup plan.

Sincerely,

Jeff Salt  
Executive Director and Lakekeeper

**Response to E-mail No. 04-07 (attached letter, cont.)**

### E-mail No. 04-08

**From:** [TA Belchak]  
**To:** <nrd.trustee@utah.gov>  
**Date:** Mon, Aug 2, 2004 11:54 PM  
**Subject:** !995 Consent Decree

Dr. Dianne Nielson

8-1

As a member of LANCE Consulting Group, L.C. we hereby request on behalf of ourselves and our clients, an additional comment period to begin on or about 15SEP2004 to extend 45 days.

The purpose of this new comment period is to continue the dialogue regarding the actual implementation of the Consent Decree.

8-2

It is our considered opinion as of this date, which is the close of the reopened comment period of the 2003 comment period, that the 1995 Consent Decree is being modified without Judiciary (The Court) approval. We hereby request that the Attorney General of the State of Utah be consulted and the opinion of the Attorney General be written in a timely manner to coincide with the opening of this new comment period. It is our considered opinion that if any terms of the court-ordered contract (Consent Decree) are modified, it is the duty of the Trustee to obtain court direction with respect to any of these modifications to the 1995 Consent Decree.

8-3

In the review of the process regarding Kennecott Utah Copper Corporation(KUCC) efforts to comply with the Consent Decree, we object to the proposed "joint" proposal as not allowed under the Consent Decree.

8-4

Also, on approximately page 20 of the "joint" proposal, is a reference to "attachment 16" of the Consent Decree. It is suggested by the communication that there are NO ATTACHMENTS to the Consent Decree, and therefore the "joint" proposal is in error, and LANCE Consulting Group is opposed to perpetuating error.

8-5

We hereby request that the Trustee no longer consider a "joint" proposal, and we look forward to the new comment period to open on or about 15SEP2004.

### Response to E-mail No. 04-08

**8-1:** The Trustee believes that sufficient time has been provided (see Response to Common Comment No. 1) for the public to review and provide concerns on the proposed project. The Trustee has elected not to provide an extension of time to the reopened comment period or to provide an additional comment period (as requested).

**8-2:** The Joint Proposal and agreements do not require a modification of the Consent Decree. See the Findings and Conclusions of the Trustee.

**8-3:** The term "joint" is language selected by the proposing parties. Kennecott (under the Consent Decree) was provided the ability to propose a project which contained the contaminated plumes and provided municipal quality water to the public in the Affected Area. The water is required to be provided through a purveyor of municipal water with defined water rights. Hence the District joined Kennecott to propose a mutually agreed upon project to the Trustee.

**8-4:** The reference to attachment 16 should have been referred to the Supporting Document of the Consent Decree. Though the Consent Decree states that the Supporting Document is not part of the Consent Decree, it does provide the underlying basis for the Consent Decree.

**8-5:** See the response to Comment No. 8-1 above. See also, Response to Common Comment No. 1.

**E-mail No. 04-08 (cont.)**

8-6 | We desire that our previous comments be answered prior to this new comment period, which hopefully will be provided to discuss any solutions that the owners of Kennecott feels are appropriate for the remediation of our aquifer.

Cordially,

Tom Belchak  
LANCE Consulting Group, L.C.  
1780 W. 9000 S.  
Suite 301  
West Jordan, UT 84088

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Do you Yahoo!?  
New and Improved Yahoo! Mail - Send 10MB messages!

CC: [saltlakerealtor@hotmail.com](mailto:saltlakerealtor@hotmail.com)

**Response to E-mail No. 04-08 (cont.)**

8-6: All comments received during the public comment periods for this proposed project have been responded to.