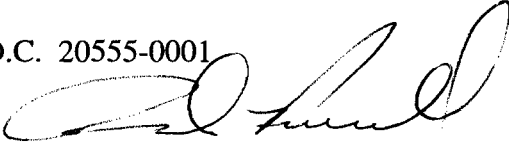


U.S. ENVIRONMENTAL PROTECTION AGENCY - REGION 6
1445 Ross Avenue, Suite 1200, 6SF-LP
Dallas, TX 75202-2733

TRANSMITTAL

40-8907

To: R.W. (Bill) von Till
U.S. Nuclear Regulatory Commission
MS: T-8a33
Washington, D.C. 20555-0001

From: Mark Purcell 
Louisiana/Oklahoma Project Management Section
Superfund Division
Tel. 214-665-6707
Fax. 214-665-6660

Date: October 21, 2003

Re: United Nuclear Corporation Churchrock Site
McKinley County, NM

Comment: Please find transmitted the documents listed below.

- | <u>No.</u> | <u>Item</u> |
|------------|--|
| 1. | USEPA's Five-Year Review Report for the United Nuclear Corporation Churchrock Site, dated September 18, 2003 (1 hard copy, 1 electronic copy) |
| 2. | State of New Mexico Environment Department's comment letter, dated September 3, 2003, on the USEPA draft Five-Year Review Report |
| 3. | The Navajo Nation Superfund Program comment letter, dated September 3, 2003, on the USEPA draft Five-Year Review Report |
| 4. | The Navajo Nation Water Quality/NNPDES Program's memorandum to Diane Malone, Navajo Nation, dated September 4, 2003, commenting on the USEPA's draft Five-Year Review Report |
| 5. | General Electric Company's comment letter, dated September 5, 2003, on the USEPA's draft Five-Year Review Report |

NM5501

LIST OF ATTACHMENTS

- A** Documents Reviewed
- B** Groundwater Data Summary
- C** Constituent Graphs for Zone 3, Zone 1, and Southwest Alluvium
- D** Site Inspection Checklist
- E** Site Inspection Photographs
- F** Interview Forms
- G** Church Rock – Draft Resolution and Environmental Right-of-Way Procedures

UNITED NUCLEAR CORPORATION



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GENERAL ELECTRIC CO.
CEP/RECO

September 5, 2003

Mark D. Purcell
Remedial Project Manager
Superfund Division
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Re: United Nuclear Corporation Church Rock Site
UNC Comments on Draft Second EPA Five-year Review Report

Dear Mr. Purcell:

On behalf of United Nuclear Corporation (UNC), we appreciate the opportunity to provide these comments on EPA's Draft Second Five Year Report (the "Draft Report") for the UNC Churchrock, NM Site (the Site). UNC agrees with EPA's basic conclusion that the remedy is protective.

EPA's draft contains numerous, and often significant, revisions from UNC's draft report provided in June 2003, and often deleted information provided – without explanation. More importantly, however, it repeatedly departs in material, but unexplained, respects from EPA's 1998 Initial Five Year Report (the "Initial Report") and the underlying decision documents, such as the ROD. It appears to reopen settled issues, with no supporting data or explanation for the change. In addition, it reaches conclusions for which we could not find any supporting data.

Regarding the fundamental questions involving the Southwest Alluvium and attenuation of uranium, UNC acknowledges that in preparing its Draft, EPA did not have access to the results of the April and June 2003 quarterly samples subsequently received in the past few weeks. UNC also recognizes that EPA's analysis of uranium concentration data would have benefited from more detailed, high-resolution plots of uranium concentration data. Therefore, in this response, UNC attempts to overcome these hindrances by providing EPA with a clearer and fuller presentation of the data that reaffirms the fundamental conclusions presented in UNC's prior request for a Technical Impracticability Waiver -- continued groundwater pumping is ineffective, but recognition of alternative

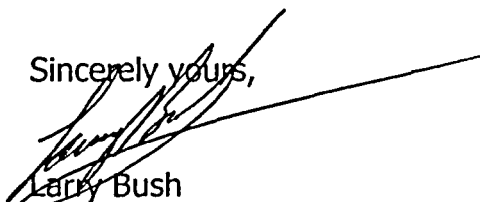


contaminant concentration limits in the context of natural attenuation, technical impracticability and implementation of institutional controls supports proceeding toward an NCP-compliant decision document. For with EPA approval and public notice and comment, this approach will lead to a remedy that is and will be fully protective now and in the future.

Because of EPA's Draft differs in so many respects from both UNC's draft and the prior Initial report, we devote a considerable amount of attention to the significant areas of departure. In some instances, this has required essentially a line by line comparison and search for supporting justification. In the limited, albeit extended time afforded for commenting, we have tried to focus on the major issues, but acknowledge that some issues might not be fully addressed. This does not constitute any waiver or agreement on the part of UNC that the report is otherwise correct.

UNC has organized its comments around general observations that apply to the report as a whole; detailed discussions of the recommendation to conduct a future supplemental feasibility study (FS) and conclusions drawn regarding the Southwest Alluvium and Zone 3, and then very specific comments.

Sincerely yours,



Larry Bush
President, UNC

I. GENERAL COMMENTS

A. EPA's Proposed Five Year Report Contains Unsupportable, Irrelevant and Superfluous Comments That are Contrary to EPA's Comprehensive Five Year Guidance

In EPA's Comprehensive Five Year Guidance, EPA 540-R-01-007 OSWER No 9355.7-03B-P, June 2001 (the "Guidance"), the contents of the report for a site are outlined:

. . . the findings and conclusions of the review, including recommendations, followup actions to issues, and protectiveness determination(s). The report should also contain the data and information necessary to support all findings and conclusions.

The Draft Report for the United Nuclear Corporation Superfund Site is replete with references that are contrary to the above referenced directions. The most significant deficiencies are noted below:

1. Executive Summary, Page ix. references General Electric and its contractors in discussing UNC's performance of remedial actions. There is no basis for listing General Electric or its contractors in this report. The contractors performing remedial work act on behalf of UNC, not General Electric. GE personnel have been engaged by UNC through an administrative services agreement to provide support, but this is no different that engaging a project manager or outside law firm to provide technical or legal services to a PRP. EPA does not ordinarily list such organizations in five year reports, and there is no basis for such a listing in this case. GE is not a PRP. UNC is a distinct legal entity from GE, and is a subsidiary of a subsidiary of GE. The only possible basis for inclusion of GE is to convey the impression that GE is legally responsible under CERCLA or other statutes for this site. There are no facts or other bases from such an inference, and accordingly, it should be stricken.
2. Site background, Page x. states that "the migration [referring to migration of groundwater contaminants] resulted from a *break in containment on a tailings impoundment that caused a discharge of approximately 93 million gallons of contaminated tailing in July 1979,*

as well as from the long-term seepage of uranium mill tailings from the site." Similar references are found on pp. 7, 9, 10 and in Section 3.4.2. The reference to migration resulting from a break in the tailings impoundment mis-states the description in the ROD, which was properly cited in the 1998 Initial Five Year Report. EPA does not provide any additional facts or information to substantiate the claim that the tailings breach was the cause. There is no support for these statements anywhere in the site records, and extensive study of the site does not bear this out. Such an assertion is incorrect, superfluous, and moreover, arguably represents a rewriting of the ROD. Further, the 1983 NPL listing found at 48 Fed. Reg 40658 (Sept. 8, 1983), does not make any reference to the tailings breach or any other site specific consideration as the rationale for listing. EPA's characterization of the tailings breach as "catastrophic" in the discussion of the hydrology at page 7 is inflammatory and unprecedented in the administrative handling of this site. EPA has offered no justification and rationale for why this incident is relevant or material to the remedial actions that are the subject to the report. Accordingly, the proposed Report should strike the reference to the tailings breach and return to the language used in the prior Five Year Report and the ROD:

The site was placed on the NPL in 1983 because of seepage from the tailings and off-site migration of radiological and chemical constituents in the groundwater.

3. Page x. The statement that "the quality and presence of groundwater that may have resided prior to the operation of the Site is a subject of some contention" misrepresents the site background issue. Moreover, it represents an unsubstantiated revision of the conclusion found in the initial Five Year report discussion of hydrology at page 4, where EPA concluded:

The majority of the water present in these units (Southwest Alluvium, Zone 1 and Zone 3) in the vicinity of the site originated from the mine water which was discharged into Pipeline Arroyo beginning in 1969 and infiltrated into the alluvium and then into Zone 3 and Zone 1. This mine discharge water, which is the primary source of recharge to the formations in the site vicinity, is referred to as the post-mining, pre-tailings water in the ROD and is considered the background water for the site. Seepage from the tailings, which was (sic) deposited into the tailings disposal area beginning in 1977, then impacted this background water.

4. Page 10. The report mischaracterizes the basis for listing on the NPL contained in the ROD, stating that "releases into the ambient air from the facility of radioactive particulate matter" was a factor, when the ROD only referenced surface water and air emissions. [The actual 1983 NPL Of September 8, 1983, does not mention any of these factors.] Moreover, as acknowledged in §3.6 of the Draft, "no other media are relevant to this review." Consequently references to air emissions, spills, and surface water are irrelevant and immaterial and should be deleted.

B. EPA has arbitrarily deleted critical information from the discussion of the Remedial Action.

In its description of the Remedial Actions undertaken at the site, EPA has arbitrarily omitted relevant and material information, which would be included under its own Guidance, including the following:

1. Unlike the initial Five Year Report, page 8, there is no discussion in the site background or executive summary of the remedial actions begun in 1982, under NMED direction and oversight. This is a material omission, since those activities resulted in the extraction of 77 million gallons of groundwater, and the neutralization of tailings liquids and precipitation of metals. Failure to include these actions may mislead the public and interested parties into believing no remedial action occurred prior to EPA's issuance of the ROD.
2. The draft report deletes reference to the remedial goals and objectives, found at page 5 of the Initial Five-year Review Report, including:

the "specific goal of the selected remedy is to restore groundwater outside the tailings disposal area to concentrations dictated by Federal and state standards, or background, *to the maximum extent practicable*, and to the extent necessary to adequately protect public health and the environment. (emphasis added).

By deletion of any reference to this goal, and specifically the recognition that achievement of the standards is subject to practical limitations, EPA improperly tries to justify its call for conducting a supplemental feasibility study, when the administrative record and Initial Five Year Report repeatedly acknowledge that achievement of cleanup standards and goals

might be unattainable, and require alternative approaches or actions.

Indeed, the Initial Five Year Report highlighted the contingencies of the selected remedy:

. . . However operational results may demonstrate that it is technically impractical to achieve cleanup levels in a reasonable time period, and a waiver to meeting certain contaminant specific ARARs may require re-evaluation as a result. Operational results may also demonstrate significant declines in pumping rates with time due to insufficient natural recharge of the aquifers. The probability of significant reductions in saturated thickness of aquifers at the site must be considered during the performance evaluations since much of the water underlying the tailings disposal area is the result of mine water and tailings discharge, both of which no longer occur. In the event the saturated thickness cease to support pumping, remedial activity would be discontinued or adjusted to appropriate levels. *Id.* at p. 8.

3. The draft report selectively quotes from the ROD regarding the components of the selected remedy. Whereas the 1998 Report simply recited the headings for each remedial component, the current draft selectively adds details and explanations for each component found in the ROD. By way of illustration and not exclusion, page 15 of the draft Report expands upon component #4 – containment and removal of contaminated ground water in the Southwest Alluvium utilizing existing and additional wells - by noting that the ROD states "seepage collection will be designed to create a hydraulic barrier to further migration of contamination [while the sources were either controlled or depleted]. What is omitted is the ROD's directive that "data obtained during performance monitoring of the extraction system should be used to determine the optimum rate of pumping, and extent and duration of pumping actually required." Consequently, the draft Report leaves the reader with the impression that the ROD contemplated hydraulic control with no allowance for monitoring data establishing that such an objective is impracticable. However, as previously noted in the ROD, Appendix A, and the Initial Five Year Report, EPA expressly contemplated that "operational results may demonstrate that it is technically impracticable to achieve cleanup levels in a reasonable time period" For the sake of accuracy,

completeness and a fair and balanced recitation of the ROD, either the Draft Report should follow the approach of the Initial 1998 Report and merely list the component headings for the remedy, or recite the entire description found in the ROD.

The Draft Report's discussion of the remedial action for the Southwest Alluvium provides another example of selective changes from the ROD and the prior 1998 Initial Report. Whereas the ROD and 1998 report stated that the wells were designed to establish a hydraulic barrier to prevent further migration through the alluvium while the source was being remediated, the proposed draft altered this statement in two significant respects. First, it references "sources" suggesting multiple contributors, but without any explanation or justification. Similarly, the remedial objective is subtly changed from "while the source was being remediated" to while the "sources were either controlled or depleted. Their omission – presumably inadvertent – presents an incomplete picture. Insofar as EPA frequently cites the ROD to support its position in the report, at a minimum, it should quote it accurately.

Finally, EPA has inexplicably chosen to omit any discussion of the factors noted on page 9 of the 1998 Initial Report, which were expected to influence the degree to which UNC's RA was able to meet cleanup standards: nonrepresentative background values, dewatering precluding operation of wells, and technical impracticability, based on performance monitoring. Those factors should be referenced in the final report, for they shape the analysis of the effectiveness of the remedy and future actions.

4. EPA's deletion of UNC's discussion of the water balance issues from Section 6.4.3.2, concerning the status of the Southwest Alluvium Remedial Action, distorts the purported effectiveness of active remediation.

In UNC's draft of the Second Five Year report, Earth Tech's June 2000 water balance analysis was referenced to show that factor was responsible for the absence of full hydraulic containment of contaminants prior to the shutdown of the pumping for the natural attenuation test. EPA's actions in deleting and ignoring this data, in order to accord unwarranted weight to active remediation, is arbitrary and capricious.

Other significant omissions or revisions include:

Page 19, regarding the North Cell, the draft report omitted the important point that the cover eliminated direct contact of surface precipitation with tailings material and minimized future infiltration. This is a significant remedial objective and accomplishment, and should not be deleted. Selective editing is inappropriate and arbitrary.

On p. 22 EPA discusses progress since the last review, yet in the second bullet, deleted important language about the TI process.

On page 46, discussing the water quality evaluation for Zone 1, the Draft states that mine-water discharge significantly recharged the Zone 1 aquifer. However, the Initial Report acknowledged that the mine water discharge was the primary discharge source. See p.8. The Draft should be revised accordingly.

On p. 51 EPA deleted the references to the TI Waiver for the Southwest Alluvium and the "Procedural Roadmap" (letter from Davis, Graham & Stubbs to EPA dated, May 18, 2000). These should be re-instated, because, their deletion tells an incomplete story.

C. EPA has arbitrarily and capriciously selectively misquoted the 1998 Initial Five Year Report to support its effort to revise the Administrative Record.

For reasons unstated in its Draft, EPA has chosen to selectively mischaracterize or misquote its Initial Five Year Report to support statements made in the draft report. For example, in its discussion of the site hydrology found on page 7 of the Draft, it cites the Initial Report as the basis for its critical description of the groundwater units, the sources of recharge, and the sources which impacted the water. Much of the discussion is word for word repetition of the text from the Initial Report, but where there are differences, they appear to follow a pattern designed to distort the nature and origin of the shallow aquifer, downplay, or rather, ignore, the role of mining discharge water as the primary source of recharge to the formations, and assert that not only tailings seepage, but impacts from the tailings breach, have been observed in the aquifers. Finally, the Draft Report ignores the continual decline in water levels subsequent to the Initial Report, which goes to the appropriateness of continued pumping and future remedial actions. Compare pp. 2, 4 and 5 of the 1998 Initial Five Year Report with p. 7, paragraph 2 of the Draft Report.

II. A Supplemental Feasibility Study is not necessary or appropriate prior to adopting remedy changes and/or Institutional Controls as recommended in the First Five-Year Review.

In the Draft Five Year Review, EPA recommends that a supplemental feasibility study (FS) be carried out to support future response action decision-making, such as implementation of ACLs and/or TI waivers for Zone 1 as recommended in the Initial Site Five-Year Review. This recommendation is inconsistent with EPA's own guidance on implementation of TI's, which clearly states that "Technical Impracticability Decisions may be made as soon as sufficient information is available to demonstrate that such a finding is appropriate." OSWER Directive 9200.4-14 at p.3]. In this case that point has been reached.

The pumps for Zone 1 were decommissioned in 1999 and UNC submitted its TI waiver request to EPA in May 2000. That submission implemented the recommendation made in the 1998 initial Five Year Review to implement the TI for Zone 1. EPA then had almost three and one-half years to evaluate the TI waiver request for Zone 1, and has had the Southwest Alluvium request since November 2002.²

All the necessary information to support the decision to implement the TI for Zone 1 as recommended in the initial Five-Year Review has been before the Agency for an extended period of time. Indeed, to accurately reflect activity at the site, the May 2000 submission of the TI Waiver Request should be reflected in the chronology of events.

Implementation of an FS at this stage would serve no purpose other than to unduly delay the process further. Moreover, it appears inconsistent with EPA's Guidance on TI Waivers, which states, "[a] typical TI "evaluation should consist of a concise stand alone report. EPA also recognizes that TI evaluations should not be avoided or deferred, but rather, "may be made as soon as sufficient information is available to demonstrate that such a finding is appropriate. (emphasis in the original) OSWER Directive 9200.4-14 at p. 3.

EPA has failed to establish an adequate factual basis for its recommendation, to explain why the prior course of pursuing a TI Waiver should be abandoned, or to justify the delay in acting on the Waiver Request – other

² UNC notes the following additional corrections with respect to this issue: On p. xii- EPA incorrectly references the TI and MNA report submitted by UNC for the Southwest Alluvium. The correct title that should be stated on p. xii is "Final Report and Technical Impracticability Evaluation - Southwest Alluvium Natural Attenuation Test".

than to say it is under review. Given that the Initial Five Year Report invited UNC to submit such a Waiver Request and acknowledged the appropriateness of such an action at this site, these failures border on arbitrary and capricious actions.

UNC therefore requests that the draft recommendation to perform a supplemental FS be omitted from the final Five-Year review.

III. Consideration of Institutional Controls Should Not be Deferred and EPA's Draft Should Accurately Portray Supporting Activity

ICs should not be examined as an issue for a future supplemental FS (p. -xv-). The IC process is already beyond the FS stage. UNC and interested parties, including Navajo EPA and the Navajo Nation have exerted significant effort to pursue institutional controls. EPA has capriciously and consciously chosen to expunge the hard work put in by the Navajo Nation and UNC to protect public health and welfare through The Tribal Resolution and Draft Environmental Right-of-Way, which EPA refers to as "unnecessary surplusage" (EPA letter to UNC dated August 15, 2003), and which were summarily deleted from the report. ICs and the status of their development and implementation are critical issues in which the public will presumably have great interest. At minimum the report should more correctly describe the status of IC development and the need for EPA to involve itself toward their successful implementation.

All parties recognize that adoption of ICs is contingent on EPA approval and appropriate public involvement. That requires EPA involvement and leadership, however. EPA has demonstrated its willingness to deploy institutional controls at other nearby Superfund sites with similar issues. See e.g., Homestake Mining Superfund Site Site Update, November 2001 (EPA), where EPA's recommendations in its 2001 Five Year Review called for implementation of institutional controls to restrict use of contaminated groundwater by local residents or land owners, without any requirement for undergoing a feasibility study. UNC requests that EPA target a milestone date for implementation of institutional controls.

Finally, on pp.64-65 EPA discusses whether ICs are in place and prevent exposure. To present a balanced and complete picture, EPA should include language about what the ICs are designed to protect. To this end, it is important to refer to the ROD which makes clear that groundwater is not a historic or current source of drinking water. Contrast this site with Homestake, where groundwater was used for drinking, and institutional

controls were recommended. UNC's recommendation for controls here represent a far higher level of protectiveness. The Five-Year Review should acknowledge that the shallow groundwater was never a usable resource, and finally, that the only constituents of concern that are being controlled (in the Southwest Alluvium) are sulfate and TDS which are naturally above concentrations that are usable.

IV. The Southwest Alluvium

The Draft report considers UNC's request for a TI waiver in the context of analysis of the remedial action and the plume analysis, and reaches a preliminary conclusion that natural attenuation is not effective in containing plume migration. Therefore, EPA recommends that pumping resume in this area. As noted in the introduction, UNC believes that EPA's conclusions reflect an erroneous interpretation of the data and do not consider the most recent data, recently provided. Since EPA did not have the past six months of monitoring data, at a minimum, its interpretations should be revisited before the report is finalized and issued. In other respects, EPA failed to correctly address aspects of groundwater hydraulics, timing and their relationship to the uranium concentration data, as discussed in detail below.

Because EPA's determinations appear premature and predicated on incomplete data or analysis, UNC submits that the most appropriate course for this site is to continue monitoring the groundwater to further evaluate the effectiveness of natural attenuation. There is no short term threat from adopting this approach, as demonstrated below. As EPA acknowledges, plume migration of contaminants above current ARARs beyond site boundaries is not expected for more than 5 years. There is ample time to consider the data and resolve the interpretation issues discussed below. However, if pumping is resumed, it will impede EPA's ability to determine whether concentrations have improved or remained constant due to natural factors. Therefore, UNC requests that EPA reconsider its recommendation and proceed with continued evaluation.

Regarding the contents of EPA's discussion of the Southwest Alluvium, UNC recommends that EPA reorganize this discussion to place the activity in context. UNC considers the historical overview beginning at page 13 of the Initial Report, where the amount of contaminants removed are reported along with identification of the remaining contaminants of concern, provides a useful model to follow. While referenced in Section 6.4.3.2 of the Draft, UNC recommends that the status of sulfate and TDS as the only contaminants above cleanup standards needs to be highlighted up front, and discussed in the context of background. In addition, any discussion of the recommended alternative remedial strategy should at least cite the Final Report and

Technical Impracticability Evaluation – Southwest Alluvium Natural Attenuation Test (Earth Tech, November 2002) and the Davis, Graham and Stubbs (May 18, 2000) letter outlining a process path.

UNC identifies the major issues concerning the Southwest Alluvium as follows:

A. EPA's Conclusion that Natural Attenuation is Not Working Rests On Incorrect Characterization of the Formerly Operating Pumping System.

The Draft report's preliminary recommendation to reject natural attenuation and resume pumping rests on an artificial and incorrect construct: that pumping was effective at containing the plume whereas natural attenuation is not. The first predicate concerning the effectiveness of pumping is not supported by the data. Water balance analyses show pumping does not achieve hydraulic containment. EPA implicitly acknowledged this point in the Draft Report in noting that natural drainage of the alluvium to the southwest exceeds the rate of groundwater pumping by 30% or more over the entire period of remediation" (p. 53). Consequently, the recommendation to resume pumping to re-establish the hydraulic barrier ignores the data and misrepresents to the reader and the public about the limited ability of the pumping system to achieve capture for most of the Southwest Alluvium. The Draft similarly overstates the effectiveness of active pumping in another important respect. On p. 52, at the end of the first para. in Section 6.4.3.3, EPA replaced the sentence "Natural attenuation reduces concentrations of metals and radionuclides to below Site standards before they reach the property boundary" with "Active remediation (operation of the extraction well system) appears to have provided effective hydraulic containment of some contaminants prior to shutdown for the NA Test". This is inaccurate based on water level and water balance considerations. Furthermore, use of the terms "appears to have" is subjective and misleading. Moreover use of the phrase "hydraulic containment of some contaminants" mis-states a basic hydraulic principle. It is simply not possible to hydraulically contain some chemicals and not others. If the data show some chemicals move, but others do not it has to be because of chemical reactions (adsorption, precipitation, etc.)

Finally, the Draft appears to present a one-side portrayal of the effectiveness of active remediation. At the end of Section 6.4.3.3, EPA deleted a paragraph containing important factual information about the what can be concluded about water levels in the Southwest Alluvium monitoring wells as shown on Figure 6-19 and reported first by Earth Tech (June 2000). It should be included for the sake of accuracy. That report read, "This evaluation indicated that groundwater pumping has not contained the plume and will not do so in the future (Earth Tech, June 2000); however, it is also true that

hydraulic plume containment is not a necessary feature of the corrective action program in the Southwest Alluvium because of the strong geochemical attenuation that occurs naturally.”

Finally, on p. 56 in the first full para. EPA should change the word “elimination” to “reduction” or re-insert the word “partial” before “hydraulic capture”. The current wording is misleading.

For the reasons outlined above, the Draft should abandon any premature conclusions regarding the effectiveness of pumping and natural attenuation until all of the data is fully evaluated, and the applicability of pending revisions to uranium standards is resolved. Until that time, monitoring should continue.

B. EPA’s Conclusion that Uranium Levels in the Southwest Alluvium Would Exceed the Promulgated MCL Level is Irrelevant

EPA notes that uranium would exceed the pending MCL of 0.03 mg/l in almost all samples collected in the Alluvium. This conclusion later emerges as a major reason behind EPA’s recommendation to abandon natural attenuation and restart pumping. As UNC reads EPA’s guidance concerning issuance of a Five Year Report, however, before EPA can rely on newly promulgated standards, it must undertake an analysis to determine whether such a change is relevant and significant. As noted elsewhere, that has not been done here by EPA. More to the point, it is undisputed that not only the identified plume, but the admitted background groundwater’s uranium concentrations would exceed this pending MCL. UNC’s analysis concludes that whether the new MCL or New Mexico’s proposed WQCS standard was adopted, background would still be exceeded, the size of the plume would not change, and re-starting pumping would not achieve any progress toward achieving these levels beyond what is already being accomplished through natural attenuation.

C. EPA’s Conclusions Regarding the Effectiveness of Natural Attenuation Are Premature

Although EPA professes that the effectiveness of a natural attenuation remedy and the TI Waiver request are still under review by the regulatory agencies, including EPA, see page 51, EPA has apparently already concluded that natural attenuation is ineffective. This conclusion appears premature and arbitrary, and should be deleted from the Draft. For among other considerations, it relies heavily on the effect of revisions to the MCL and state standard for uranium, but EPA has not conducted the analysis, much less undertaken the necessary steps to comply with the NCP, to modify the ROD and adopt these new standards as ARARs. As EPA notes, ARARs generally remain frozen at time of issuance. Until EPA resolves the status of newly

promulgated ARAR standards and evaluates the concentration levels in the background waters against revised standards, it cannot reach any decision concerning whether natural attenuation would achieve alternative standards.

D. The Data Does Not Support EPA's Conclusion that Uranium Concentrations Have Dramatically Increased as a Result of Cessation of Pumping

As a preliminary observation, the Draft Report constantly uses hyperbolic descriptions of data changes, such as "dramatically", which have no place in what is suppose to be an objective presentation of data. Moreover, EPA provides no criteria or statistical reference by which to judge a change as dramatic. Specifically, on p. 58, EPA bullets six observations, five of which refer to a "dramatic" increase in uranium concentration during and after the natural attenuation test. UNC believes all of these references should be deleted and data changes be described either in terms of what were the data readings before and after pumping halted or percentage changes. In addition, EPA's data analysis ascribes increases to uranium concentrations to the presence or absence of pumping without identifying what data correspond to which period.

To be fair, as noted earlier, the originally submitted plots of uranium concentrations before and after pumping did not distinguish the before and after conditions as much as is possible. UNC refers the EPA to Figures 1-7 which are more detailed, high-resolution plots of uranium concentration over time. The seven plots are for the wells EPA cites as having the uranium problems (wells 509-D, 801, 802, 803, GW-1, GW-2, and GW-3), and on the plots UNC has precisely demarked pre-shutdown data from post-shutdown data.

Well 509-D Concentrations of uranium at well 509-D (Figure 1) began to rise one full year before the pumping system shut down, and they have fluctuated randomly between 150-250 ug/L ever since shutdown. There is no trend in post-shutdown data. In addition well 509-D is located outside of the zone of influence of the former pumping wells. Thus, the uranium data for well 509-D undercuts EPA's thesis that pumping worked. To the contrary, using EPA's reasoning, it would indicate just the opposite because concentrations rose while the pumps were on and stopped rising when they were shut-off.

Well 801 Concentrations of uranium at well 801 (Figure 2) were at their highest just before the shutdown and thereafter steadily declined, throughout the natural attenuation test and beyond, as EPA concedes. They decreased and stabilized at concentrations approaching the long-term average

concentration during pumping. Certainly this data does not suggest that pumping was advantageous. If anything it indicates that, given enough time, slugs of uranium-bearing water have a tendency to approach a concentration that is constant, whether or not the pumps are running.

Well 802 Well 802 was a pumping well that was shut down on January 8, 2001. Concentrations of uranium at this well (Figure 3) are higher than the concentrations just prior to shutdown, and they should be because there is no longer the dilution of less-impacted groundwater being drawn into the well and/or there is re-saturation of alluvium as the water levels rises. This is a normal, highly localized condition that should not be interpreted as demonstrating any real benefit or protectiveness. Moreover, the data since shut down do not show an increasing trend. They are variable, but steady within the 200-250 ug/L range. UNC expects that the concentrations will eventually decline naturally as they have done for well 801.

Well 803 This well is similar to 802, and as can be seen on Figure 4 only one of 21 samples since shutdown showed higher uranium concentrations than the two high concentrations that were analyzed before the shutdown in 2000. Frankly, this is statistically remarkable because the frequency of sample collection was so much greater after the shutdown. Therefore uranium concentrations in well 802 indicate that natural attenuation is equivalent or better than pumping. Furthermore, once the most recent data are considered, the data related to the early shut down period no longer supports any statistically defensible conclusion that there is an upward trend in concentration. UNC will provide the statistical analysis that supports this conclusion under separate cover.

Well GW1 EPA asserts a "dramatic" increase in uranium concentrations in Wells GW1 from a stable trend while pumping was off during the NA test. Although uranium concentrations appear – at least initially – to increase (Figure 5), when the data is analyzed further, a different picture emerges. The upward trend of increasing concentrations of uranium preceded the pumping shutdown, and thus cannot be attributed to the lack of pumping. Second, more recent data shows concentrations are declining, suggesting that conditions have stabilized and whatever initial increase occurred was an anomaly. This pattern is not unusual, having occurred at many wells over the long term – see e.g., Well 801, GW1 and GW 2. Taken as a whole, the most that can be concluded from the data is that pumping has not made any discernable difference in the concentration or migration of uranium in groundwater.

Wells GW-2 and GW-3 Wells GW-2 and GW-3 are similar (Figures 6 and 7, respectively). Well GW-2 has no statistically definable trend following

shutdown, and well GW-3 has a statistically definable upward trend, though it is weak. When the last six months of data are also viewed, it seems that further monitoring is warranted instead of concluding that the pumps should be activated.

EPA deleted statements about UNC's statistical analysis of uranium data on p. 54 for no apparent reason. UNC's analysis showed that background uranium concentrations could not be statistically distinguished from uranium concentrations in seepage-impacted wells, and we are forwarded the results of the simple two-population tests under separate cover. For accuracy and completeness, UNC recommends that EPA include the following statement at the end of the second full para. on p. 54, "Statistics calculated using the 2002 Performance Monitoring data indicate that there is not a statistically significant difference between uranium concentrations in the impacted versus background water."

E. EPA's comments concerning plume characterization in the Southwest Alluvium are incorrect.

EPA's statement on p. 52, "The extent of the plume in the downgradient direction has not been defined," is misleading. The plume has been characterized for all Contaminants of Concern except sulfate and Total Dissolved Solids (TDS), as EPA correctly states on the same page. Those two compounds are naturally occurring in levels above drinking water standards in background water. To be completely accurate, it is alkalinity and TDS that are not fully defined because seepage-impacted water is defined on the basis of alkalinity (bicarbonate)(see p. 53), but this is not required under the ROD as alkalinity and TDS have no bearing on human health or the environment. Further, the prior Five-year Review found no basis or need to undertake such action.

Before any further activity is undertaken concerning delineating the extent of alkalinity and TDS, EPA should identify how such work will advance the remedial objectives, given that background levels of dissolved solids exceed drinking water standards and alkalinity is benign and unregulated. In addition, EPA would need to exercise its authority under Section 106 to obtain access for UNC to undertake further investigation, as UNC has exhausted all avenues to gain access to the location that EPA wants to install another well. This is well documented in correspondence from UNC to EPA. The report should say so in the interest of completeness.

V. Specific Comments

A. EPA's Position that a Technical Impracticability Waiver Requires a ROD Amendment, or a new ROD is Incorrect.

In its discussion of the recommendation regarding submission of a TI Waiver for the Southwest Alluvium, page 23, EPA states that any decision to approve ACLs, a TI waiver or ALARA must be made through a new ROD, amended ROD, or Explanation of Significant Differences (ESD). However, as noted in the prior Five Year Report, the possibility of actions such as those contemplated in the request for natural attenuation, a TI waiver and institutional controls were expressly recognized in the initial ROD. See page 8 of the Initial Five Year Report. Where EPA put the public and interested parties on notice in the initial ROD of the possibility of changes such those at issue here, it is well within EPA's discretion to approve action without incurring the additional delay inherent in the more formal EPA steps. EPA's Guidance on Technical Impracticability Waivers, OSWER Publication 9234.2-25, does not contemplate issuance of new RODs or Amended RODs and allows for the possibility of changes through an ESD. It does require public notice and an opportunity for comment. UNC supports such notice and comment but submits that there is no compelling requirement here to pursue the most burdensome and time consuming path, especially when EPA and the interested parties have had the request for more than a year.

B. EPA Fails to Identify How It Will Address Public Participation in Evaluating the TI Waiver Request.

EPA states that adoption of the waivers will require "appropriate decision-making...in accordance with the NCP". UNC agrees, and believes the report should inform the public about how EPA intends to do this.

C. The Draft's description of the origin and nature of the shallow ground water formations is inaccurate, misleading, unsupportable and inconsistent with the ROD and prior Five-Year Review.

The first Five-year Review (EPA, 1998) clearly described the origin and nature of the shallow groundwater that is being addressed in the remediation of the Church Rock site:

"This discharge water [referring to the minewater discharge] saturated the previously unsaturated near-surface formations. Historic data indicate that, prior to mining and milling operations, a shallow groundwater aquifer did not exist in the area". Id. At p. 2.

Similarly, on p. 4 the Initial Review states, "This mine discharge water, which is the primary source of recharge to the formations in the site vicinity, is referred to as the post-mining, pre-tailings water in the ROD and is considered the background water for the site." By contrast, the current draft (at pp. 9, 46, and 52) offers an interpretation that is inconsistent with EPA knowledge and understanding reflected in the Initial Review and prior investigations overseen by the Agency. EPA offers no new data or supporting studies to justify this revisionism, nor has it ever provided public notice, comment, or other minimum due process considerations to explain the basis for repudiating prior studies and reports.

As recognized in the Initial Review, groundwater did not exist prior to mining – there is no natural zone of saturation in any of the impacted media. The report should say so. Inconsistent statements in the draft report should not be retained without some scientific justification. In a similar vein, mine water discharge is the source rather than a "significant source" of recharge to the shallow aquifers. The report should say so. The "aquifers" represent a temporary condition and they are naturally draining. The report should say so.

- D. A focused assessment of remedial alternatives for Zone 3 should be recommended, but not in the form of a supplemental feasibility study.

UNC has previously informed EPA and interested parties of its belief that additional steps may be required for Zone 3. Toward that end, UNC recommends evaluation of alternatives to contain and remove the Zone 3 contaminant plume via technology reviews and demonstration pilots (e.g. hydraulic fracture tests). UNC anticipates that a report and recommendation could be submitted

in the less than two months. UNC recommends that EPA approve this approach. To conduct this via a formal FS process will needlessly slow down progress for containing a plume that appears not to have fully stabilized.

E. Sulfate and TDS

On pp. 48, 57, and 64 EPA's revisions to the first draft add uncertainty about the role of gypsum equilibria as the essential control over sulfate and TDS concentrations. Certainty about the role of gypsum equilibration is a straightforward, scientifically supported fact based on the data. UNC suggests that EPA delete the word "likely" on p. 48, change "may be" to "is" on p. 57, and change "may be" to "are" on p. 64.

EPA's revisions downplay the insignificance of these two parameters with respect to human health and the environment on p. 56. For this reason UNC suggests that it is more correct and complete to insert, "The standards set for sulfate and TDS are not for the protection of human health. The secondary standards are not federally enforceable but are intended as guidelines. Therefore a TI waiver is appropriate for sulfate and TDS."

F. Miscellaneous

- P. 64 – UNC is not seeking ICs for Zone 3. It is evaluating options to make that unnecessary. ICs are really only needed for Zone 1, and they are being sought for the Southwest Alluvium where minewater discharge quality exceeds drinking water standards for sulfate and TDS by dissolving naturally-occurring minerals.
- P. 73 – Change "Investigate merits to eliminate...." To "Eliminate....." because the pertinent criteria are already met as stated in Section 6.4.4.
- P. xii – For clarity add "In Zone 3..." to the sentence that begins "Groundwater monitoring, including...".

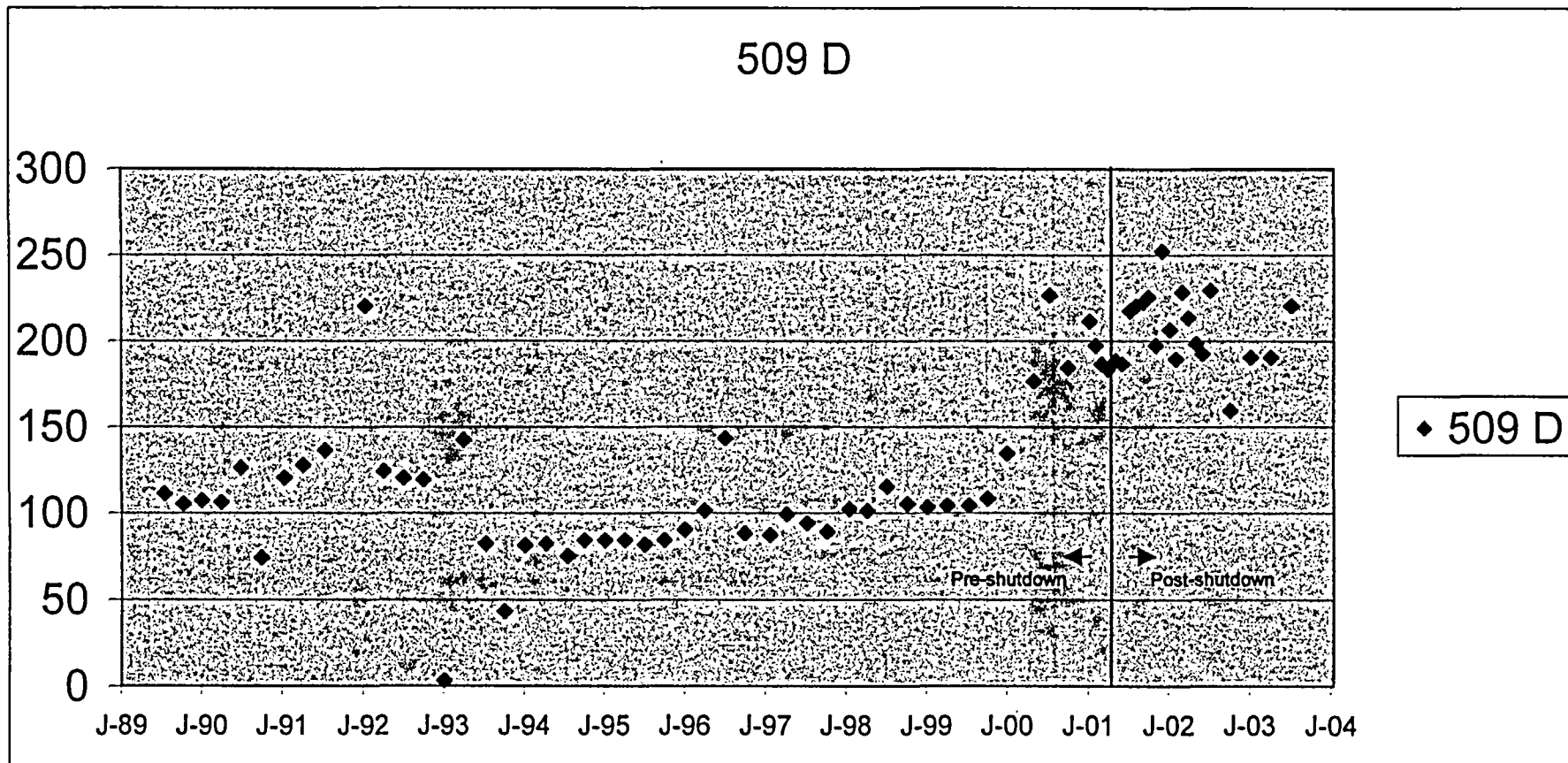


Figure 1
Church Rock
Second Five-year Review

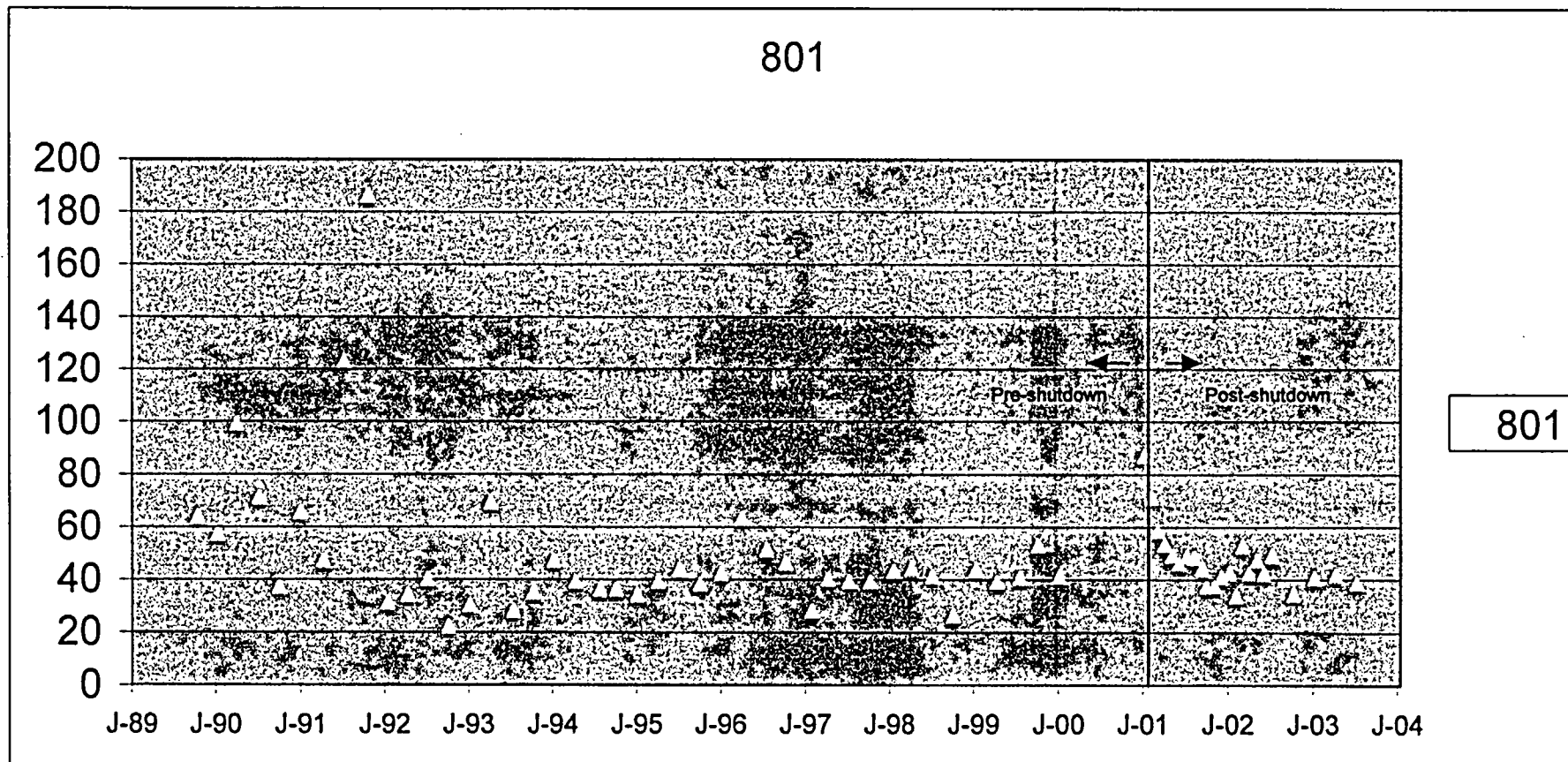


Figure 2
Church Rock
Second Five-year Review

802

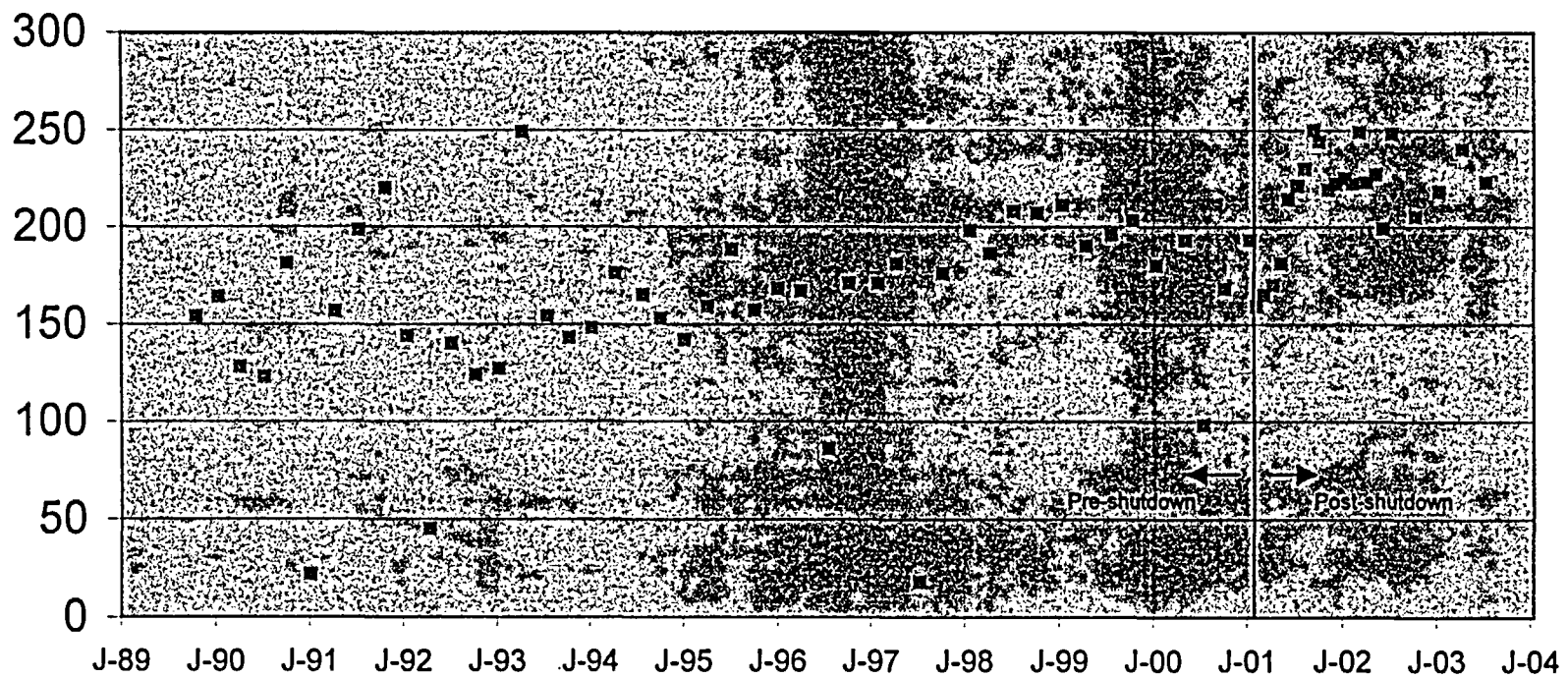


Figure 3
Church Rock
Second Five-year Review

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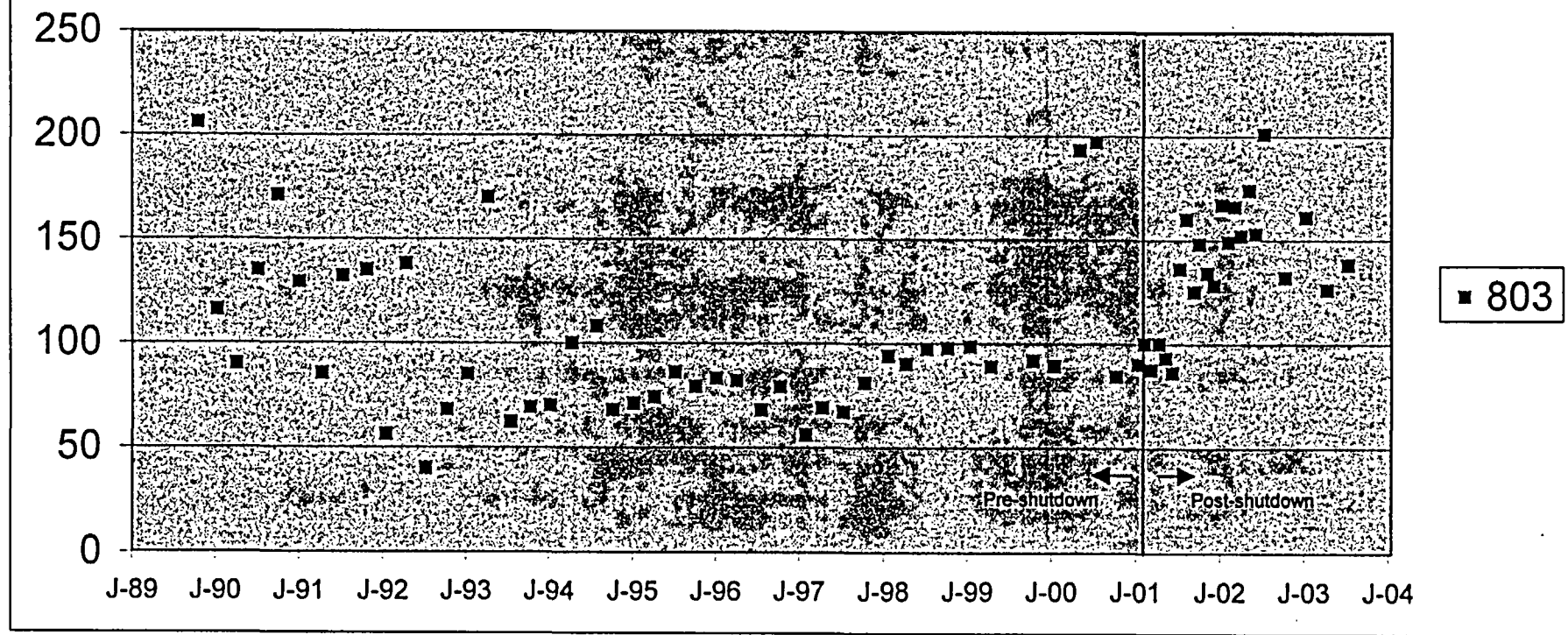


Figure 4
Church Rock
Second Five-year Review

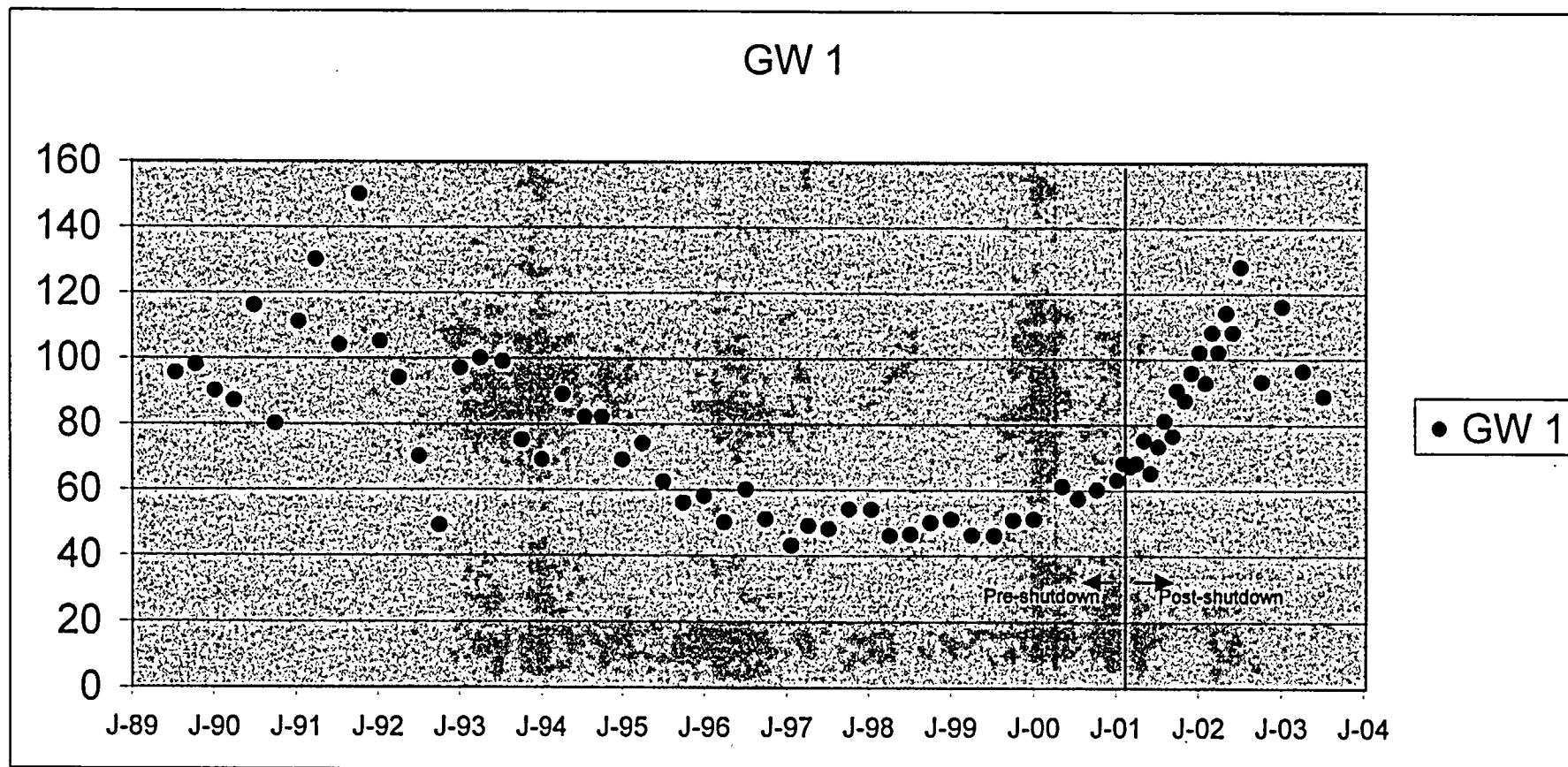


Figure 5
Church Rock
Second Five-year Review

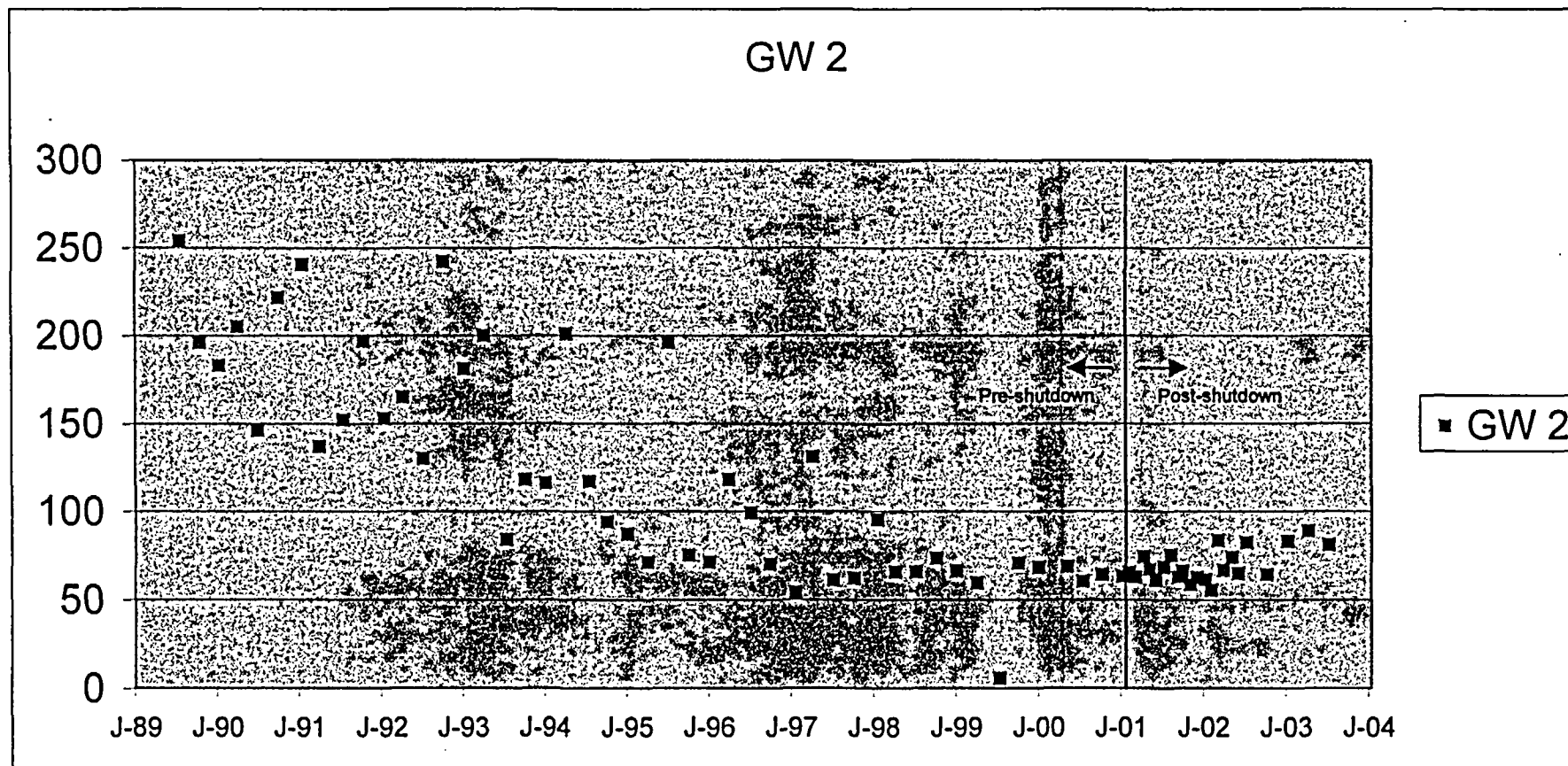


Figure 6
Church Rock
Second Five-year Review

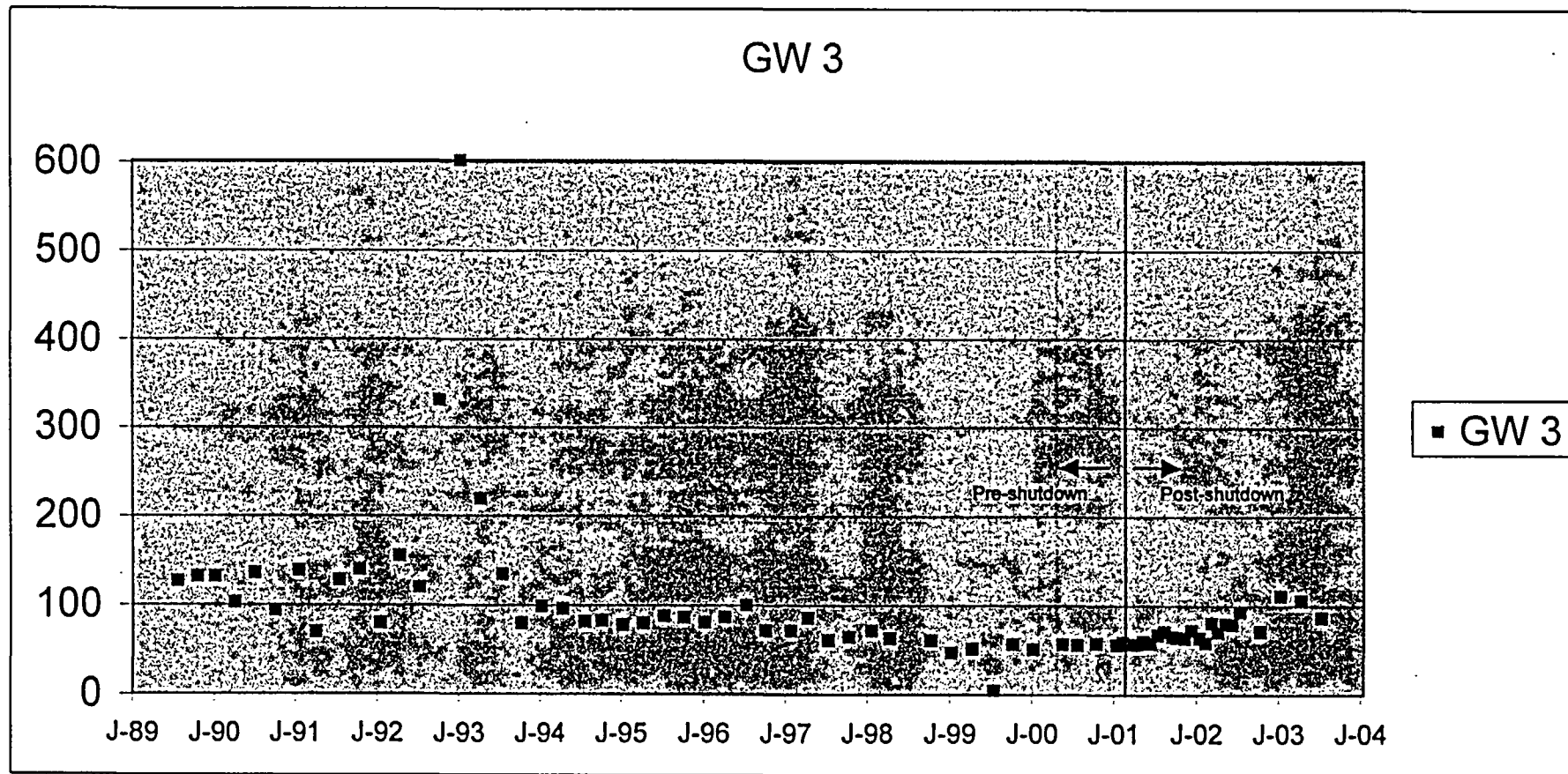


Figure 7
Church Rock
Second Five-year Review



BILL RICHARDSON
GOVERNOR

**State of New Mexico
ENVIRONMENT DEPARTMENT**

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RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

September 3, 2003

Mr. Mark Purcell
Remedial Project Manager
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue, Suite 1200 (6SF-LP)
Dallas, Texas 75202-2733

RECEIVED
03 SEP - 8 PM 2:38
SUPERFUND DIV.
DIRECTOR'S OFFICE

**Re: Review of May 2003 Draft Five-Year Review Report, Section Five-Year Review Report
for United Nuclear Corporation, OU-1, Church Rock Site, McKinley County, New
Mexico, May 2003.**

Dear Mr. Purcell:

Thank you for providing the New Mexico Environment Department (NMED) with the opportunity to comment on the May 2003 draft Five-Year Review for the United Nuclear Corporation (UNC) Church Rock Superfund site near Church Rock, New Mexico. NMED submits the following comments:

General: NMED supports EPA's recommendation to turn the pumps back on in the southwest alluvium, because uranium concentrations and concentrations of other contaminants of concern (COC) increased after the pumps were turned off and because detailed graphs and trend analysis presented in the November 2002 Final Report and Technical Impracticability Evaluation show that concentrations of some of the COC were changing while the wells were actively pumping, indicating that pumping may have been effective.

General: EPA, in the document, appears to be supporting UNC's viewpoint that because modeling shows that sulfate is at equilibrium, pumping is not an effective means to decrease sulfate and TDS levels in ground water to the site standard. NMED disagrees with this viewpoint. Several factors besides whether or not a substance is in equilibrium with the media should be considered before determining whether or not the substances can be remediated. Trend and spatial analyses should be conducted and carefully evaluated to determine if pumping is influencing contaminant concentrations.

General: Please change the following text throughout the document: "New Mexico Water Quality Act Standards (NMWQA)" to "New Mexico Water Quality Control Commission (WQCC) Regulations. These standards are not listed in the NMWQA. The correct citation for the standards is 20.6.2 NMAC.

General: This document (and the previous 5-year review) refers to the following as possible administrative remedies if site standards will not be reached with the current remedy: Technical Impracticability, alternative concentration levels (ACLs), or ALARA demonstrations. NMED understands that these are presented as they were presented in the 1998 five year review and that UNC/GE is now specifically proposing TI waivers. We still suggest, for the record, that EPA include NMED's alternate abatement standards under NMWQCC regulations one of the possible administrative paths.

General: NMED suggests adding the following to the list of recommendations for future reporting requirements: regular trend analysis and graphical presentation for specific components in specific wells for components that are being proposed for a TI waiver.

Introduction, end of page 3: NMED suggests the following language for the last paragraph: The first Five-Year Review for the site was conducted in 1998 and generally concluded that since *little progress had been made in reaching* CERCLA ground water remediation goals ~~had not been reached~~ with respect to components of the remedy, Respondent UNC (the site owner and operator) could apply for alternate concentration limits (ACLs) or technical impracticability (TI) waivers.

Table 2-1: This table should include dates for the approval to temporarily shut down southwest alluvium wells and the dates these wells were shut down.

Section 3.4.3: Please change the last paragraph as follows: "The background water, unaffected by tailings fluid seepage, exceeds *New Mexico Water Quality Control Commission drinking-water* numerical ground water standards for several contaminants, including sulfate and total dissolved solids (TDS)."

Table 3-1: Chloroform and Lead-210 are not included on this table, but they are included in Table 7-1. NMED suggests adding a footnote to explain when these substances were added to the list of ARARs.

Table 4-1: Please define "MM". Is this the correct unit for the numbers in this table? If not, please correct the table.

Section 5.0, 2nd bullet under "General": Please cite the June 10, 1996 report "Evaluation of the Statistical Basis for Establishing Background Levels and Remediation Standards at the United Nuclear Corporation Church Rock Uranium Mill Tailings Disposal Facility" generated by the Nuclear Regulatory Commission (NRC). The basis for changing the background levels to the current levels is explained in this report.

Section 5.0, 1st bullet under "Southwest Alluvium" summary of progress: The text states: "Although concentrations have not exhibited any statistically significant change, over 131 million gallons of water were extracted between 1998 and 2001, which contained 3.3 million pounds of sulfate, 84,000 pounds of nitrate, 1,300 pounds of manganese, and other constituents." NMED disagrees that "concentrations have not exhibited any statistically significant change". Table B.7 in the 2002 "Final Report and Technical Impracticability Evaluation, Southwest Alluvium Natural Attenuation Test" shows that several wells had either a downward or upward trend prior to ending pumping.

Section 5.0, last bullet under Zone 1: The recommendation from the previous five year report was "All converted ground water monitoring wells must be analyzed quarterly to determine if target constituent concentrations statistically increase over time." Please state that contaminant trends in these wells have not been analyzed to determine if they are statistically increasing over time.

Section 6.1: The text should be changed as follows: Agency representatives assisting the review team included: Bill Von Till, NRC; Kevin Myers, NMED *Ground Water Quality Bureau, Mining Environmental Compliance Section Division*; ~~Robyn~~Robin Brown, NMED *Ground water Quality Bureau Project Manager, Superfund Oversight Section*; Arlene Luther, Navajo Nation EPA; and Diane Malone, Navajo Nation EPA.

Section 6.2: Please change NMED's 800 phone number to (800) 219-6157, not (800) 879-3421. Also, add the suite number (N2300) to the address.

Section 6.4.1.2, 3rd paragraph: The text states "The entire Zone 3 aqueous plume (discussed below) appears to be within the bedrock block to the east of this lineament, where the overall dip is very gently to the northeast." Further discussions indicate that the dip is to the northwest. Please make sure the discussion is consistent.

Section 6.4.1.6, Sulfate and TDS Section: NMED suggests the following change in language to the last paragraph prior to the metals section: "~~However, it does not appear that~~ Natural attenuation or active remediation ~~will may not~~ reduce sulfate concentrations below the site standard because the concentrations are *partly* controlled by groundwater equilibrium with the common, naturally-occurring mineral gypsum (as in the Southwest Alluvium and Zone 1)."

Section 6.4.3.4, 1st paragraph: The text states "The NA Report was submitted to EPA, NMED, and NRC on November 4, 2002 (Earth Tech, November 2002); an approval is pending." Please clarify this statement. Does EPA plan to approve the report, or are they still determining whether or not they will be able to approve the report?

Section 6.4.3.4, 2nd and 3rd paragraph: Please clarify that the views expressed in this paragraph are those presented by UNC in their 2002 Natural Attenuation (NA) report, unless EPA agrees with the report conclusions. NMED disagrees with several points made in the paragraph including:

1. "UNC also concluded that natural attenuation reduces sulfate and TDS concentrations to non-impacted background levels. This is demonstrated by the sulfate concentrations from wells within the plume that are equivalent to the non-impacted background concentrations."

UNC has not shown that the natural system is reducing the concentration of TDS at any particular location within the plume.

2. *"Although the remediation system did remove sulfate and TDS mass, the concentrations, which are dependent on the chemical equilibrium of gypsum, remained similar to those previously achieved through geochemical processes that occur within the existing aquifer. The concentrations of sulfate and TDS do not appear to be dependent on continuing the current pumping operations, but may be controlled instead by natural geochemical reactions."* Sulfate and TDS levels appear to be partly controlled by pumping. Concentration trends for sulfate and TDS for many wells near the pumping wells trended down while UNC was pumping the wells. After cessation of pumping, some of those wells showed upward trends of sulfate and TDS concentrations.
3. *"No change in trend was observed for the sulfate concentrations because these are naturally equilibrated with gypsum."* Table B.7 in the 2002 NA report states shows that prior to testing sulfate trended up in 1 well, down in 8 wells and had no trend in 4 wells. After pumping was stopped, sulfate trended up in 2 wells, down in no wells, and did not have a trend in 11 wells. This indicates that there was a "change in trend".

Section 6.4.3.4, 4th paragraph: NMED suggests adding the following language to this paragraph: "However, based on its review, a different conclusion has been made by EPA on the effectiveness of natural attenuation in mitigating radionuclides *and possibly sulfate and TDS*. The results appear to indicate that natural attenuation is not as effective as pumping for controlling the migration of *some of the contaminants of concern Uranium*."

Section 7.1.1.2, 2nd paragraph: NMED suggests the following changes: "Performance monitoring, conducted both before and after the extraction systems were shut off, indicates that, *for most site COCs*, natural attenuation may be at least as effective as, if not more effective than, the active remediation systems in attenuating the seepage-impacted water. Acidic seepage is being neutralized, resulting in attenuation of metals and radionuclides. Cleanup levels ~~cannot~~ *may not* be achieved for sulfate, manganese, and TDS, which exceed the site standards in background ground water as well as seepage-impacted ground water."

Section 7.2.1.1 Numbered bullets on changed ARARs: Please include sulfate in this list to be consistent or remove nitrate and TDS since the site standard changed for these substances due to background re-analysis, not due to changes in the Maximum Contaminant Limits (MCLs).

Section 8.2, 2nd paragraph: Please change the text as follows: "*The report also states that active remediation (pumping) is not effective in reducing sulfate and TDS concentrations because the concentrations of these two constituents are controlled by natural geochemical conditions.*"

Section 8.3: NMED suggests the following change: "Since the system has been shut down, natural ~~attenuation has limited physical factors such as adsorption and dilution are slowing~~ the migration of contaminants *with respect to the flow of water in Zone 3*".

Section 8.4: NMED suggests discussing increases in sulfate and TDS as well as uranium during the "natural attenuation test".

Section 9.0: The 2nd paragraph states: "Another follow-up action which does not effect the protectiveness of the remedy is the investigation of the merits to eliminate lead, lead 210, and selenium from the site monitoring program." If EPA has a guidance document on this issue, other than the DOE citation made earlier in the report, please cite that guideline in this document.

Figure 6-16: Please alter the x-axis of this graph to display a date; currently a number is displayed, i.e., "32509".

Table 7-1: Please clarify the following on this table: What do the last 2 columns signify "Standard compared to in 2002 Annual Review"? Are these the current site standards? State the source for the listed standards for sulfate, nitrate, and TDS (i.e. revised background analysis performed by NRC). Why is the standard listed for chloroform 0.001 mg/L if this is not an ARAR?

Please let me know if you have any questions about these comments. My phone number is (505) 827-2434

Sincerely,



Robin Brown
Geoscientist
Superfund Oversight Section

CC: Kevin Myers, Mining Environmental Compliance Section, GWQB



**THE
NAVAJO
NATION**

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PRESIDENT
JOE **SHIRLEY, Jr.**
VICE PRESIDENT
FRANK J. **DAYISH, Jr.**

September 03, 2003

Mark Purcell
Louisiana/Oklahoma Project Management Section
Superfund Division (6SF-LP)
1445 Avenue, Suite 1200
Dallas, TX 75202-2733

RE: Five-Year Review for UNC Church Rock Uranium Mill Site

Dear Mr. Purcell,

I contacted the Navajo Nation technical reviewing staff within the Navajo Nation and the Navajo EPA to coordinate the comments. However, several staff requested additional time to review and comment. They felt that thirty days comment period is too short of a turnaround for a thorough review. Comments may still be forthcoming from these individuals.

My comments are as follows:

- 1) The alternatives: "Institutional Control" mentioned in the review needs further discussion. The Navajo Nation EPA does not recommend the use of Institutional Control on any projects, especially, superfund activities where groundwater is impacted. The Navajo Nation also does not have a mechanism in place to enforce the IC, which would require a permanent staff to oversee the project, however due to lack of funds, this may hinder the establishment of such oversight program for IC. Also the Institutional Control needs a boundary or "distance in radius", from the site where IC would be enforced.
- 2) Tailing seepage in Zone 1 of the Gallup sandstone will make that aquifer unusable for generations (from the EPA ROD); Th- 230 alone, 7 half-lives is when the activity decrease to ten percent of its original, so assuming 7 half-lives that is 77,000 years x 7 or 539,000 years, divided by 30, which is 18,000 generations. Upon talking with US EPA, this is moot, because there is not enough water in this aquifer to supply a well.
- 3) US EPA measurements in wells used by people and animals within 4 miles found no levels exceeding standards. It is difficult to determine background

concentration of contaminants; these background levels are used as limits if they are higher than federal or state statutes.

- 4) Currently, the Hydro Resources Incorporated (HRI) proposed an In-situ uranium-mining project, which is located approximately 3 or 4 miles south of UNC project; The In-situ mining would involve groundwater (aquifer) impacts, which may also impact the controlled area.
- 5) Other project involves housing development proposed which is located approximately 7 miles south of the site. The plan includes using the onsite water wells (aquifers) for this development.

Lastly, I would reiterate to US EPA and to the company that public involvement is very important. Currently, the communities express concerns over the impacts from the pass uranium mining and that more development in uranium mine is being plan for this Church Rock Area.

If you need additional information, please call me at (928) 871-7820 or 871-6859,

Thank you for the opportunity to comment on the Five-Year Review.

Sincerely,



Diana Malone. Environmental Program Supervisor
Navajo Superfund Program
Waste Regulatory Compliance Department
Navajo Nation EPA

XC: NSP file



THE NAVAJO NATION

Navajo Nation Environmental Protection Agency
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(928) 871-7690

JOE SHIRLEY, JR.
PRESIDENT

FRANK DAYISH, JR.
VICE PRESIDENT

M-E-M-O-R-A-N-D-U-M

TO: Diane Malone, Environmental Program Supervisor
Navajo Superfund Program
Waste Regulatory Compliance Department
Navajo EPA

FROM: Patrick Antonio, Program Manager/Principal Hydrologist
Navajo EPA - WQ/NNPDES Program

DATE: September 4, 2003

SUBJECT: DRAFT 5-YEAR REVIEW UNC CHURCH ROCK SITE

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DIRECTOR'S OFFICE

The objective of the subject document is to determine whether the Superfund remedy for the former uranium mill tailings site is protective of human health and the environment. To date, the remedy has been deemed to be protective of human health and the environment because there are no known users of the impacted Gallup Sandstone and alluvium aquifers so there has been no evidence of exposure. This may not be the case in the future as the plumes in the Zone 3 and Southwest Alluvium aquifers continue to migrate down-gradient past the UNC property boundaries.

Gallup Sandstone - Zone 3 Aquifer

The extraction well system was shut off in 2000 because it was determined to be accelerating the migration of the plume rather than containing it. Shutting down of the extraction well system allowed evaluation of the neutralization of the seepage impacts and natural attenuation of contaminants. Since the shut down, the effective attenuation rate in Zone 3 has been determined to be slower than that in both Zone 1 and the Southwest Alluvium.

Cobalt and nickel concentrations in Zone 3 exceeded their cleanup standards. It is unclear if the primary source of the cobalt and nickel is the background water as it was deemed for arsenic and molybdenum. Cobalt and nickel do not attenuate until the pH is equal or greater than 6.5. As the plume in Zone 3 continues to migrate, cobalt and nickel concentrations will exceed their standards further down-gradient. Combined radium concentrations may also exceed cleanup standards despite continued attenuation.

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Page 2

Gallup Sandstone - Zone 1 Aquifer

Active remediation of Zone 1 ceased in 1999 without all cleanup standards being achieved, including outside the UNC property boundary (TDS, sulfate, manganese, cobalt, nickel). The extent of seepage impacts has not changed in the past five years. Without active remediation and reliance solely on natural attenuation, TDS and sulfate concentrations are not expected to meet cleanup standards, manganese concentrations will be dependent on the availability of bicarbonate, and cobalt and nickel concentrations will fall below the cleanup standards over time. Natural attenuation of the cobalt and nickel concentrations is again dependent on the pH being equal or greater than 6.5.

UNC is recommending an alternative remedial strategy involving the use of Institutional Controls (ICs) to support both a Monitored Natural Attenuation (MNA) (for chloride, metals, radionuclides) and Technical Impracticability (TI) Waiver (for sulfate, TDS, manganese). There are four types of ICs: governmental controls, proprietary controls, informational devices, and enforcement tools with an IC component. UNC was working with the Navajo Nation on developing a governmental control (environmental right-of-way) in Section 1. In a change of position, Navajo EPA is now looking unfavorably at ICs based on administrative and financial reasons. If ICs are still to be considered, the enforcement type appears to be the only viable option now that Navajo EPA is opposed to ICs. Proprietary controls and informational devices both involve land ownership which will require Navajo Nation administrative and financial responsibilities. It is unclear if U.S. EPA can implement enforcement with an IC component at the UNC site.

Southwest Alluvium Aquifer

Active remediation of the Southwest Alluvium was temporarily discontinued in February 2001 to evaluate the ability of the contaminants to naturally attenuate in the impacted aquifer. Although UNC concluded that "natural attenuation was at least as effective as pumping for controlling the migration of contaminants", U.S. EPA disagreed countering that natural attenuation does not appear to be as effective as pumping for controlling the migration of uranium. This increase in uranium concentrations may also indicate that seepage from the tailings disposal cells is still impacting the aquifer. For quite some time, it has been assumed that seepage from the tailings disposal cells to all impacted aquifers had been disconnected. The extraction system should be restarted to re-establish a hydraulic barrier to tailing seepage migration.

The plume in the Southwest Alluvium is well past the UNC property boundary down-gradient into Section 10. There is no clear delineation on the leading edge of this plume in Section 10. For the Southwest Alluvium aquifer, like with the Zone 1 aquifer, UNC is looking at an alternative remedial strategy involving the use of ICs to support both a MNA and a TI Waiver. Not

UNC 5-YEAR REVIEW

September 4, 2003

Page 3

withstanding Navajo EPA's new position with regards to ICs, it appears both premature and impracticable to focus efforts on ICs for the Southwest Alluvium considering (1) uranium concentration increases, (2) possible impacts from the tailings disposal cells, (3) the need to re-establish a hydraulic barrier, and (4) no clear delineation of the plume's leading edge.

Throughout the report, it is mentioned that most wells at the UNC site would not be able to meet the new MCL, if adopted by U.S. EPA, for uranium (0.03 mg/l) and that most background levels would also exceed the new MCL. It is unclear if promulgation of new MCLs is automatically implemented as new cleanup standards.

The following is a summation of my review of the 5-year review of the UNC cleanup:

- Recommend evaluation of other remedial alternatives to contain and remove the Zone 3 plume
- Recommend restarting the extraction system in the Southwest Alluvium aquifer to re-establish an hydraulic barrier to tailing seepage migration
- Recommend delineating the leading edge of the plume in the Southwest Alluvium aquifer
- Uncertainty on the implications resulting from Navajo EPA's position opposing ICs

The remedy for the UNC site will not be protective of human health and the environment if continued plume migrations and contaminant concentration increases are not addressed in the Zone 3 and Southwest Alluvium aquifers. If you have any questions, contact me.

xc: Mark Purcell, Superfund Division, U.S. EPA Region VI
File