nuclear watch new mexico

July 31, 2002

Mr. James P. Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Ref: Los Alamos National Laboratory Facility Order

Dear Mr. Bearzi:

Nuclear Watch of New Mexico ("NWNM ") respectfully submits these comments on the New Mexico Environment Department's ("NMED") Draft Los Alamos National Laboratory (LANL) Corrective Action Order of May 2, 2002. Thank you for the opportunity to comment. We also salute you, your staff and NMED as whole for initiating this Order. We believe that it has tremendous potential, so long as NMED remains resolute behind the Order's apparent intent to induce genuine comprehensive cleanup at LANL.

These comments are formatted in sequential alignment with the draft Order, beginning with the Determination. Quotes from the draft Order are italicized. Some general comment follows the section by section comments.

Determination of an Immanent and Substantial Endangerment to Health and the Environment: NMED largely grounds its release of the draft CAO upon its Determination of an Immanent and Substantial Endangerment against LANL. NWNM supports that finding. Being the amateurish wannabe lawyers that we are, we believe that finding is on a solid legal basis and that the DOE/LANL/UC challenges claiming that it is not are, in fact, unsupported. We commend NMED on its finding.

The progress of LANL cleanup is dismal (for example, please recall the1997 DOE Inspector General's audit that found that out of some $360 million spent by the lab for cleanup by 1995 only roughly 20% had gone to actual cleanup). The Cerro Grande Fire accentuated the immanent and substantial endangerment, which could have been largely pre-empted had there been effective lab cleanup in the past. Finally, the persistent pattern of declining funding for lab cleanup naturally causes grave and reasonable doubts that the lab would ever embark upon comprehensive cleanup.

Frankly put, the DOE/LANL/UC challenges appear ill conceived and insubstantial. For example, UC's "Complaint for Declaratory Relief and for Review of Administrative Action" makes the claim that "The AEA [Atomic Energy Act] provides DOE with the exclusive authority to regulate all pure radioactive waste and the radioactive portion of any waste mixture." This is, to put it charitably, an extravagant (even radical) claim. As much as we think it a "root of all evils," we don't dispute DOE's legal claim over jurisdiction over "purely" radioactive wastes. But for UC to categorically assert that it (as LANL's manager) also has sole jurisdiction

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over mixed radioactive waste flies in the face of the relevant portions of the Resource and Recovery Conservation Act and the Federal Facilities Compliance Act. In sum, we strongly support and urge NMED to vigorously work to fend off UC's legal challenge which, were it successful, would not only inevitably block the Order itself but also provide precedent to rollback hard won environmental laws. We further comment that UC's challenge is in and of itself illustrative of that institution's regressive (perhaps even "colonial") attitudes, attitudes that we suspect it wouldn't dare so blatantly express in its own parent state. In short, we strongly urge NMED to vigorously fight off UC's unmerited challenge while simultaneously proceeding with the issuance of the final Order.

Section I. Introduction: NWNM applauds NMED for its issuance of the draft CAO. The Department, in our view, deserves much credit for finally doing something meaningful, aggressive, comprehensive and forward looking in its regulatory enforcement role over LANL. We salute the Secretary and his staff for having done so - - they all deserve much credit. We want to emphatically state our praise.

Our concerns with the draft CAO lie not so much within the Order as much as they lie outside in directly related developments, for example the Letter of Intent co-signed with DOE setting forth certain agreed upon "accelerated cleanup" principles and LANL's Performance Management Plan. These are a crucial part of our comments that we strongly argue that NMED should not summarily reject just because they could be narrowly interpreted as lying outside the bounds of relevant comment. It is NMED who made these comments relevant through its decision to enter into an agreement with DOE, and hence they should be seriously considered and responded to.

Our most critical general observations of the CAO itself are two:

1) **The Order should have been issued more than a decade ago.** This is an obvious fact that current NMED officials freely acknowledge, hence we feel no need to belabor it here. However, the fact should be held in mind throughout the entire Order process (and accordingly in any integrated permit issues) that time is of the essence and that much time has already been lost. There should be much zeal on the part of NMED to finalize the Order and to then vigorously implement and enforce it as needed. Furthermore, now that NMED has decided to put itself in the driver's seat (where it should have been all along) and given that LANL/UC/DOE have decided to contest that by seeking to overthrow the order in order, NMED should remain resolute. And that is with a departmental sense of conviction that should and must survive any changes in state administration.

2) Our second critical general concern is that **this Order mandates no actual corrective measures, that is to say cleanup**, another obvious fact which again current NMED officials freely acknowledge. Instead, this Order is essentially a glorified information request by NMED of LANL, albeit with the virtue of real legal weight. However, NWNM refrains from wholesale condemnation of this Order because of its lack of mandated cleanup precisely because we believe that this Order can lead to genuine and comprehensive cleanup if the Department stays zealous about it. This leads us to strongly support this Order generally while awaiting exactly how it unfolds. Unfortunately, the matter of how exactly this Order manifests (and by extension future cleanup at the lab as well) will be largely influenced and determined by issues outside of the Order, some of which we attempt to address in these comments. But we restate here that we strongly support this Order, so long as NMED remains zealous in both implementing it and protecting it from DOE/LANAL/UC challenge while using it as a platform for proceeding directly into real cleanup. Again, time is of the essence.

Section II: Findings of Fact and Conclusions of Law .

II.A. Findings of Fact: NWNM concurs with all of the facts presented therein. It is a good, and even damning, summary of the status of cleanup and various environmental affairs at LANL. We note that all the facts presented have to do with the Respondents and NMED. We suggest that it could possibly be worthwhile noting that declining LANL cleanup budgets led NMED to doubt that all of the noted deficiencies and lab cleanup in general could ever be rectified for the foreseeable future.

II. B Conclusions of Law:

Conclusion # 10: We strongly support NMED's assertion that *"Such monitoring and reporting [of radionuclide contaminants] is necessary for the Department to properly implement the regulation of hazardous wastes constituents, and other solid wastes pursuant to the HWA and the Hazardous Waste Regulations. United Sates v. New Mexico, 32 F. 3d 494 (10th Circuit 1994)."* DOE is notorious for its lack of knowledge about the characterization of its own wastes, including admissions to that very effect in legally required NEPA documents (see, for example, the 1997 DOE Waste Management Programmatic Environmental Impact Statement (whose preparation had to be enforced by citizen litigation to begin with)). Additionally, there have been many waste characterization issues concerning the New Mexico State Waste Isolation Pilot Plant permit. Experience has taught that DOE must be forced to properly characterize its waste to begin with, hence the justification for NMED to require monitoring and reporting of radionuclide contaminants is legally justifiable. We also concur that the case law cited above strongly buttresses this argument (interestingly NWNM personnel played an originating role in that case law, but that is another story).

Conclusion #11: NMED appropriately asserts it jurisdictional authority over DOE and LANL through the provisions of the Resource and Recovery Conservation Act and the Hazardous Waste Act. NMED should also note its jurisdictional authority invested by the Federal Facilities Compliance Act.

Section III. A Purposes: The draft Order states that its purposes are

> 3*) to identify and evaluate alternatives for corrective action measures to cleanup contaminants in the environment, and to prevent or mitigate the migration of hazardous wastes or hazardous constituents at or form the Facility, and 4) to implement such corrective measures.*

Purposes #3 and 4 are not backed up by Order Section XII Compliance Schedule Table (which we consider to be where "the rubber hits the road") with the possible partial exception of Corrective Action Measures Studies. This leaves us with critical general questions that we feel NMED should answer. Does NMED contemplate this Order to be a "work in progress" which will be continually added to or, alternatively, will there be subsequent Orders that mandate actual corrective action measures? And to what extent will the pending renewed LANL RCRA permit incorporate corrective action measures. Please clarify.

Section III. C Jurisdiction: Again, NWNM believes that the Federal Facilities Compliance Act should be referenced as appropriate.

Section III. G Work Plans and Schedules: It is essential as well that NMED is expeditious in its review and approval/disapproval of work plans and schedules. Directly related to this, it is also essential that NMED secures its resource base so that it can be expeditious.

Section III. J Availability of Information: *"the Respondents shall, within a reasonable time after a request from any authorized representative of the Department, furnish information to the Department relating to hazardous wastes that are or have been managed at the Facility."* Given LANL's past chronic delays, if not outright obfuscation, in providing environmental information and reports, NWNM strongly recommends that precise times be mandated rather than "a reasonable time."

Section III. Enforcement: As previously implied, NWNM supports NMED in vigorous enforcement as needed.

Section III. N Relationship to Work Completed: It is important that NMED gets the lab to inventory what might be satisfactory work already completed in order to save taxpayers money and to effect5ively accelerate genuine cleanup at LANL. At the same time, its obviously holds true that NMED must investigate and soundly judge for itself whether or not previously work is satisfactory, and to reject it if it isn't.

Section III.O Integration with Permit: *Subsequent to the issuance of this Order, the Department may renew the Hazardous Waste Facility permit issued to the Respondents for the Facility under the HWA, and such permit may incorporate the requirements of this Order. The requirements of this Order shall not terminate upon issuance of such permit.*

NWNM strongly believes that in the final Order NMED needs to better explain and clarify exactly how and where the Order, possible future Orders and future permits may or may not intersect (particularly the pending renewed LANL RCRA permit).

Section IV. Facility Investigation: To what extent will the reports and information generated be available to the public? What are the mechanisms for that? Obviously we regard access to significant information to be very important and clearly in the public's interest. We suggest the use of both NMED's and LANL's web sites. The public has been largely denied access to the latter web site following 9.11. We argue that public access should be restored in the environmental arena.

Section IV A. 3.b Groundwater Monitoring Plan: NWNM concurs with NMED's requirement of an interim groundwater monitoring plan within 90 days. We are pleased that this should end the incessant delays to such a plan.

Section IV A. 3.d Background Investigation: Care needs to be exercised here that indeed "naturally occurring" metals and radionuclides are determined for background concentrations and not contaminants induced by the lab. We also strongly recommend that LANL should be required to determine what proportion of groundwater tritium contamination might be reactor-produced vs. accelerator-produced. As NMED knows, this determination would help to clarify its jurisdictional authority over tritium contamination at the lab since accelerator-produced jurisdiction is not exempted by the Atomic Energy Act.

Section IV A. 3.e. Monitoring Wells and Piezometers: It is important that split sampling with NMED upon demand should be reiterated here (the Order generally states that need elsewhere).

Section IV A. 3.f Springs: ditto

Section IV A. 4 Sediment Investigation: ditto. We also applaud the focus in this section on post-Cerro Grande Fire effects.

Section IV B.1.c Historical Investigation [of Canyon Watersheds]: NWNM believes the list of requirements to be excellent. We strongly recommend as an addition that LANL should be required to determine what proportion of tritium contamination might be reactor-produced vs. accelerator-produced. As NMED knows, this determination would help to clarify its jurisdictional authority over tritium contamination at the lab since accelerator-produced jurisdiction is not exempted by the Atomic Energy Act.

Section IV.C Technical Area Investigations

Area G: We applaud NMED's concerted focus n TA-54 and Area G in particular. NMED should know that during discovery for its Clean Air Act lawsuit Concerned Citizens for Nuclear Safety obtained extensive inventory summaries of wastes disposed of at Area G. This included reactor rods, activated targets from the Los Alamos Meson Physics Facility (now LANSCE) and "classified shapes." In short, Area g is far from being the "low-level" radioactive waste dump that LANL pretends it to be.

Additionally, the Order should require closure plans for Area G, and also explain how Area G issues may intersect between it and the pending renewed LANL RCRA permit.

Section IV. C. b [TA-21] Historical Investigation: We applaud NMED's concerted focus n TA-21. Since TA-21 has two long operating tritium facilities NWNM believes it would be prudent for NMED to require that LANL determine what proportion of tritium contamination might be reactor-produced vs. accelerator-produced. NMED would then have to approve or disapprove of that determination and require another, if necessary.

Section IV. C. 3 Technical Area 50, MDA C: There are clearly a number of important TA-50 environmental issues not narrowly defined to MDA C (this is not to disparage NMED's efforts with respect to TA-50 MDA C). It has been long known that TA-50's Radioactive Liquid Waste Treatment Facility (RLWTF) has operated without a state permit while at the same time its discharged effluent chronically exceeded State nitrate discharge levels and DOE Derived Concentration Guidelines for radionuclides. A process for finally issuing a state permit for the RLWTF was initiated some four years ago, but for whatever reason, was aborted. As far as we know, the RLWTF still operates without a State discharge permit. This Order should address the need for that permit. Additionally, that permit should incorporate a remediation plan for the RLWTF's rather notorious past discharges that have resulted in extensive contamination of Mortandad Canyon's perched aquifers (which are nominally State protected). And, as already previously mentioned a number of times, LANL should be required to determine what proportion of tritium contamination might be reactor-produced vs. accelerator-produced.

Section IV. C.4 Technical Area 49: NWNM applauds NMED for finally addressing environmental restoration issues at TA-49 (God knows that LANL was never going to do it by itself). Given that in the early 1960's LANL conducted explosive hydronuclear tests that deposited an estimated 88 pounds of plutonium and other radioactive/hazardous materials in shafts this will no doubt prove a difficult test case as to how NMED will mandate environmental restoration at the lab. We will be especially curious as to whether LANL might attempt to take advantage of cost and feasibility escape clauses (loopholes in our view) incorporated in the Order for this particular situation. Whereas NWNM is not prepared to categorically reject the need for such provisions, we strongly and will continually argue for the most judicious granting of them by NMED.

Section IV. C. 5 Technical Area 10: NWNM applauds NMED for addressing environmental restoration issues at TA-10.

Section V Investigations for Other SWMUs and AOCs: NWNM wants to strongly support NMED's efforts with respect to the Technical Areas already addressed in the draft Order and at least partially commented upon herein. However, it is obvious that there are many other Technical Areas that need to be addressed. For example, we find it curious that Technical Area-16 is not immediately addressed in the draft order and strongly argue that it should be. Our rationale is given the EPA's past finding of high explosives contamination at deep groundwater levels exceeding its safe drinking water advisories that TA-16 should definitely be at or near the top of the list that NMED is tackling. Also, by way of example, other Technical Areas of great concern to us are TA-3 (the most densely populated TA and locale of the Chemical and Metallurgical Research and Sigma facilities)
and TA-55 (the site for plutonium processing and fabrication activities since the mid-1970's). We argue that the final Order should specifically address TA-16 while, at a minimum, explain how other critical TA's will be addressed in the future (if not outright addressed in the final Order). And, again, we argue that the final Order should explain how issues pertaining to theseTechnical Area may or may not intersect with the pending renewed LANL RCRA permit.

Section V. D. Newly Discovered Releases form SWMUs or AOCs: Given potential post-Cerro Grande Fire effects, NWNM recommends that NMED pay particular attention to and mandate action as needed for stormwater runoff flows that could possibly induce contaminant migration.

Section V.G Interim Measures: NMED must know of present RCRA violations, a list of which we have repeatedly requested and been denied. The alternative that NMED simply does not know is unacceptable since that would indicate that the regulator has indeed been truly asleep at the wheel. NWNM strongly recommends that interim measures for known RCRA violations be incorporated into the final Order so that it is genuinely meaningful and points towards real and tangible remediation.

As described in our consultant's comments under Section VIII there may be evidence that EPA 's Preliminary Remediation Goals for radionuclides may be exceeded in certain LANL locations. NMED should look into this possibility, reach a preliminary judgment on the presence or not of hazardous and/or mixed wastes and order interim measures as needed in order "to reduce or prevent migration of contaminants or human and environmental exposures t contaminants while long range corrective action remedies are evaluated and implemented."

Section VI. On-Going Investigations: No substantial comment. We do compliment NMED in the apparent thoroughness of its draft requirements.

Section VII.C.1 RISK ANALYSIS General: *"The Respondents shall attain the cleanup goals outlined in Section VIII of this Order…"* Section VIII in the draft Order is too vague in a number of cases. Please see our comments under that Section.

Section VII.C.2.a Conceptual Site Model: *"For human health considerations, the conceptual site model shall include residential land use as the future land use for all risk assessments. Site-specific future land use may be included, provided that written approval to consider a site-specific land use has been obtained from the Department prior to inclusion in the risk assessment"*. NWNM strongly endorses the application of residential land use as the standard for corrective action measures, with certain caveats (please see our Section VIII. Comments). The escape clause for consideration for "site-specific future land use" could be a gigantic loophole, one that DOE/LANL/UC will be sure to exploit. In our view, in order to protect posterity and the environment, the standard of residential land use should be universally applied at LANL (with due allowance for possible agricultural uses as well).

The prospect of possible consideration of other site-specific future land uses raises a host of process questions. How is the public to be informed of that possibility? How is the decision to be made, simply in an agreement between LANL and the NMED? How might this intersect with the LANL RCRA permit process, which does have clear public process requirements? These are critical questions that we believe the final Order must address.

Section VII.C.2.b Risk Screening Levels: Please see our relevant comments under Section Viii.

Section VII. D. 3 Cleanup Standards: Please see comments on Section VIIII.

Section VII. D.4.Remedy Evaluation Criteria: *"[F]actors shall be balanced in proposing a preferred [remediation] alternative… A remedy that reduces risks with little long-term management, and that has proven effective under similar conditions, shall be preferred."* This in many ways strikes at the heart of what the quality of future cleanup will be at LANL. What DOE/LANL/UC want is clearly known, must concretely demonstrated by the June 2002 LANL draft Performance Management Plan (PMP). That document is heavily reliant on DOE's so-called Long Term Environmental Stewardship program. In fact, the PMP calls for the termination of all DOE Environmental Management activities by 2015: "All required post-remedy monitoring and maintenance will be transitioned from EM to the site landlord, the National Nuclear Security Administration (NNSA), through the Long Term Environmental Stewardship program." (PMP, p. ii - iv). This is, of course, after DOE/LANL/UC have met lab "cleanup" according to their own terms, which incorporates such self-serving assumptions such as that groundwater treatment will not be needed and "cap and cover" as the presumptive remedy for MDAs. As part of the final Order, in NWNM's opinion, NMED should require DOE/LANL/UC to detail its Long Term Stewardship program plan for the lab, as that plan will arguably directly impact "cleanup." Currently, DOE/LANL/UC is pinning its hopes of avoiding comprehensive cleanup on a program that has no substance and is entirely rhetorical in nature. NWNM asserts that the DOE/LANL/UC approach to future lab cleanup is directly contrary to the draft Order's purpose as expressed in this section, and the final Order should take aggressive measures to eliminate those differences. While other factors may have to be "balanced," our paramount concern is genuine remedial activities that actually reduce risk to human health and the environment.

The draft Order further states "a remedy that can be implemented quickly and easily, and poses fewer and lesser difficulties, shall be preferred." That is fine as a balancing factor, but can indeed be
A slippery slope that plays into the hands of DOE/LANL/UC. To take it to the extreme for the sake of discussion, were "implementability" to be the overriding factor in the selection of remedies then NMED might as well sign onto and endorse LANL's Performance Management Plan, which is mostly a do nothing plan easy to implement. In the final Order, NWNM suggests that ease of implementability be relegated to a lower level as a criterion.

"A remedy that is less costly, but does not sacrifice protection of health and the environment, shall be preferred". Again, this is a slippery slope, one that we suspect DOE/LANL/UC will attempt to exploit as an excuse for not cleaning up. Cost should be relegated to a lower level as a criterion.

Section VII. D.5 Approval of Corrective measures Evaluation Report: NWNM wants to know what access to these reports the public will have.

Section VII. D.6 Relationship to Corrective Action Requirements: *"The Corrective Measures Evaluation shall serve as a Corrective Measures Study for the purposes of RCRA compliance."* Again, the final order should better explain the relationship between the Order and the pending renewed LANL RCRA permit.

Section VII.E.2 Corrective Measures Implementation Plan: What role or opportunity to comment will the public have in NMED's final selection of remedies?

Section VII.E.4 Community Relations Plan: The Respondents should be required to place relevant documents on the LANL ES&H web site. What is NMED's community relations plan for ongoing public involvement during the implementation of the final Order in all of its aspects?

Section VIII. Cleanup and Screening Levels: In many respects NWNM regards Section VIII as the most important section in the Order, perhaps the one most determinative of future cleanup at LANL. We generally strongly support the selected target risk level of 10^{-5} (however, see our important caveats below). We do think it is an eminently defensible position that NMED selected the middle ground between the EPA's recommended range of 10^{-4} to 10^{-6} for lifetime excess cancer risk. Having said that, we are fearful that the 10^{-5} risk factor will be completely skewed by a struggle to begin in the near future over the application of residential vs. industrial standards in the determination of environmental restoration remedies at LANL. We argue in the strongest possible terms that in order to ensure genuine protection for human health and the ecology that NMED must vigorously pursue the application of residential standards at LANL. At the same time, agricultural scenarios also need to be seriously considered as well. This is also eminently defensible given that the lab has been in existence for less than sixty years, while agricultural use in the general has been in existence for at least a 1,000 years. Even LANL, too, will pass someday, and NMED needs to strongly protect the environment for the future unpredictable needs of posterity. Section VIII in the final Order needs to more strongly reiterate the statement made in Section VII.2. a that "the conceptual site model shall use residential land use as the future land use for all risk assessments." This needs to move far beyond the merely conceptual level. It is already known that DOE/LANL/UC are making the self-serving critical assumption that industrial standards will be used.

The remainder of our comments in this Section were prepared by our consultant Mr. Bernd Franke of the Institut fur Energie und Umweltforschung (Institute for Energy and Environmental Research) of Heidelberg, Germany. His comments are also relevant to other sections as specifically and previously noted.

1. NMED selected a reasonable cleanup target risk level of 10^{-5} for individuals that is equivalent to about 0.2 mrem/year committed effective dose equivalent (CEDE) using current risk factors by the U.S. Environmental Protection Agency (EPA) for radioactive contaminants. It should be appended by establishing an annual dose limit of 1 mrem/year CEDE.

In Section VIII, NMED selected a reasonable cleanup target risk level. The risk level can be translated into annual radiation exposure over lifetime. The risk factor for low dose rate for cancer morbidity is 7.6×10^{-7} (EPA-1994). Based on this value, the lifetime risk of 10^{-5} is equivalent to an exposure of about 0.2 mrem/year CEDE. It is prudent to use a low risk level to account for uncertainties in the characterization of contaminated areas and associated risks and in order to be consistent with cleanup risk targets used elsewhere in the US. The risk level is compatible with the *"de minimis"* dose limit of 1 mrem/year CEDE that is used as a target dose for clearance of radioactive materials in international regulations (IAEA-2002, EC-1996). This dose equivalent is necessary because a limit for the maximum annual dose of 1 mrem/year will result in the average dose over lifetime-years to be much smaller than 1 mrem/year. This will likely be in the range of 0.2 mrem/year. While the target risk is reasonable, we recommend appending this by limiting the maximum annual dose to 1 mrem/year CEDE.

2. NMED should adopt EPA's screening level of 10^{-6} risk from single pollutants in addition to a total target risk to individuals of 10^{-5}.

NMED deviated from the EPA procedures by allowing that a single pollutant could exhaust the target risk level of 10-5. According to EPA, even a single pollutant exceeding the screening level calculated at the 10^{-6} risk level may need to be investigated in further detail. NMED's soil cleanup levels for 133 elements and compounds are based on a target total risk of 10^{-5} for carcinogenic substances. The NMED approach to using the EPA screening factors multiplied by 10 would allow areas with only a single pollutant identified at a risk level of less than 10^{-5} to avoid further detailed consideration.

NMED's suggested use of the target risk is not consistent. While the target risk for non-radioactive carcinogens is 10^{-5}, radionuclide concentrations in soil have to be compared to EPA's preliminary remediation goals for radionuclides in soil that reflect a 10^{-6} target risk. NMED claims: *"Comparison of individual radionuclide concentrations to the EPA preliminary remediation goals assures that the total excess risk from radionuclides will not exceed the Department total excess risk goal of 10^{-5}."*

This claim would only be assured if there is no risk from non-radioactive pollutants and if there are less than 10 different radionuclides.

To alleviate this shortcoming, we recommend that the target risk for individual pollutants (whether radioactive or non-radioactive) should be 10^{-6} and that the target risk level from all pollutants combined should not exceed 10^{-5}.

3. NMED should establish a collective dose target risk for radioactive and non-radioactive pollutants.

The focus of the NMED approach is on individual risks. While it is important to limit the risk to a given individual, care should be exercised to limit the overall potential harm to human health because in radiation protection (and likewise for non-radioactive carcinogens), adverse health effects down to very low levels are wisely assumed. A useful approach to reflect this is to limit the cumulative population exposure of populations, in addition to the risk to individuals.

This is done, for example, in the current regulation for the release of radioactive materials (such as metals) from regulatory control (usually termed "clearance" if the concentration of radionuclides is below a certain level). For example, the European Commission has instituted levels which are supposed to ensure that the radiation dose to the maximally exposed individual does not exceed 1 mrem/yr CEDE. In order to avoid the possibility that this practice could lead to widespread low-level contamination, the European Commission established a population dose limit of 100 person-rem per year from an activity (EC-1996). [In this context, "activity" is a defined act of clearance in the country.] In other words, since the maximum dose from clearance of radioactive materials to an individual is 1 mrem/year, the overall goal is to limit the number of people exposed in the entire country.

One may (and should) argue about the appropriate population risk target. In the worst case, reuse of contaminated property may result in exposures to many individuals. NMED could, for example, set a target collective risk over the next 500 years from all cleanup operations in New Mexico. We recommend that the potential hazards associated with the reuse of Los Alamos National Laboratory (LANL) property should be determined in the course of cleanup activities, also accounting for continuing operations at LANL.

4. NMED should select the most restrictive usage scenario (residential, agricultural or other) for all substances under review. NMED should provide cleanup values for the agricultural scenario for non-radioactive pollutants.

The Draft LANL Order Section VIII.B.1 specifies for non-radioactive carcinogens, and only "residential soil" as specified in EPA Region VI Human Health Medium Specific Screening Levels (HHMSSL). These include the following scenarios (NMED-2000)
Residential soil (with and without dermal exposure)
Industrial indoor worker (without dermal exposure)
Industrial outdoor worker (with and without dermal exposure)
Groundwater

With regard to radioactive carcinogens, NMED does not set cleanup levels but rather refers to "reporting levels". The reporting levels are the preliminary remediation goals (PRG) for radionuclides in soil for which EPA uses a variety of scenarios that include the following:
Residential soil
Agricultural soil
Indoor worker soil
Outdoor worker soil
Groundwater

The fact that NMED did not setup cleanup levels for radionuclides while arguing that data be presented for the "agricultural soil" scenario, while at the same time cleanup values are established by NMED for non-radioactive carcinogens that do not include the "agricultural soil" scenario is a striking inconsistency in NMED's approach to the LANL site.

Because NMED's cleanup levels for non-radioactive pollutants do not contain values for "agricultural soil", it is more than likely that this results in the selection of "residential soil" for radioactive pollutants. This is unacceptable on several grounds:

It is inappropriate to ignore the "agricultural soil" scenario for non-radioactive pollutants.
Out of 845 radionuclides for which PRG values have been established by EPA, the "residential soil" scenario yields the strictest values in only 24 cases (2.8%). In contrast to this, the "agricultural soil" scenario represents the strictest values in 809 cases (95.7%). In the remainder 12 cases (1.5%), the strictest standard for groundwater protection (Dilution Attenuation Factor, DAF=1) yields the strictest PRG values.
Based on the foregoing, the "agricultural use" is often the most restrictive scenario; the likely selection of "residential use" as a scenario would thus prejudice cleanup strategies and ignore the most conservative approach.

A detailed analysis for radionuclides that are commonly reported for the LANL site (strontium-90, cesium-137, plutonium-238, plutonium-239 and americium-241) is provided in Figures 1 through 5. The charts provide a comparison of the maximum and the mean concentrations measured in on-site soil in the year 1998, the values selected by LANL as the "Regional Reference Level" (LANL-1999). Also shown are EPA PRG values for the "residential soil" and "agricultural soil" scenarios as well as the soil clearance values in the current German radiation protection guideline (StrSchV-2001).

Figures 1 and 2, for example, indicate that the current concentrations of strontium-90 and cesium-137 found in onsite soil at LANL as well the "Regional Reference Level" exceed EPA's PRG for residential soil. Is it likely that NMED will require cleanup under these circumstances? If it does not in the case of strontium-90 and cesium-137, how then can NMED justify cleanup of other radionuclides down to comparable risk levels?

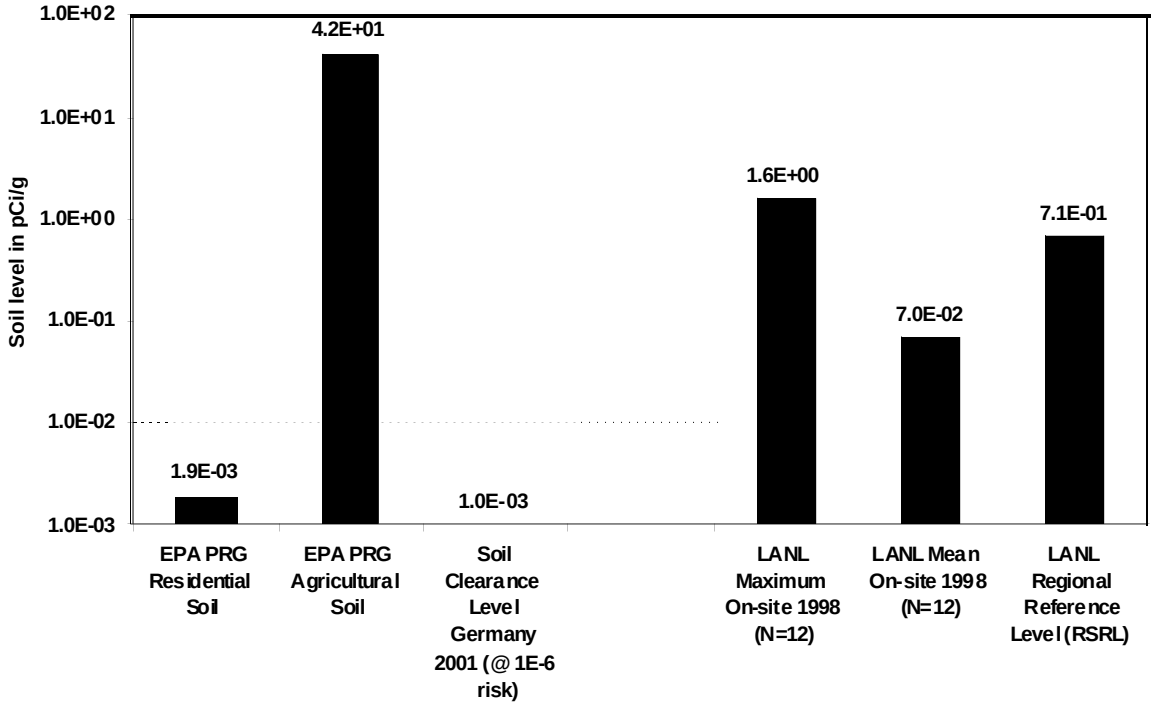

Figure 1. Comparison of remediation goals for strontium-90 in soil with soil levels reported by LANL

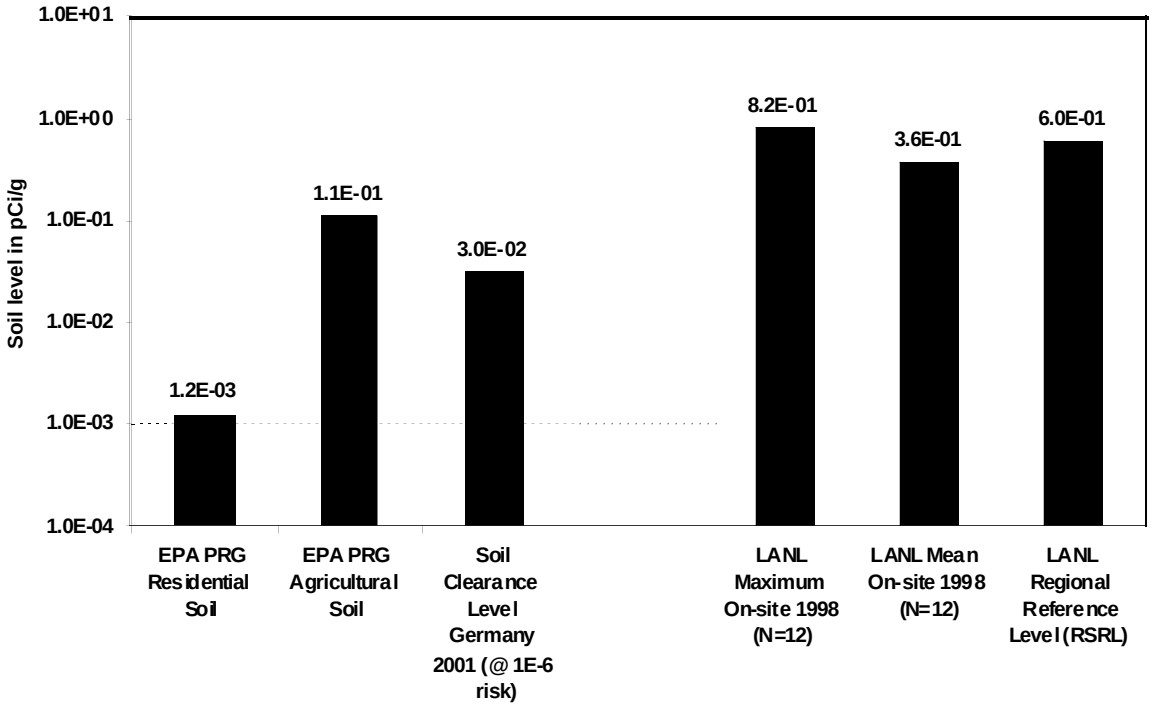

Figure 2. Comparison of remediation goals for cesium-137 in soil with soil levels reported by LANL

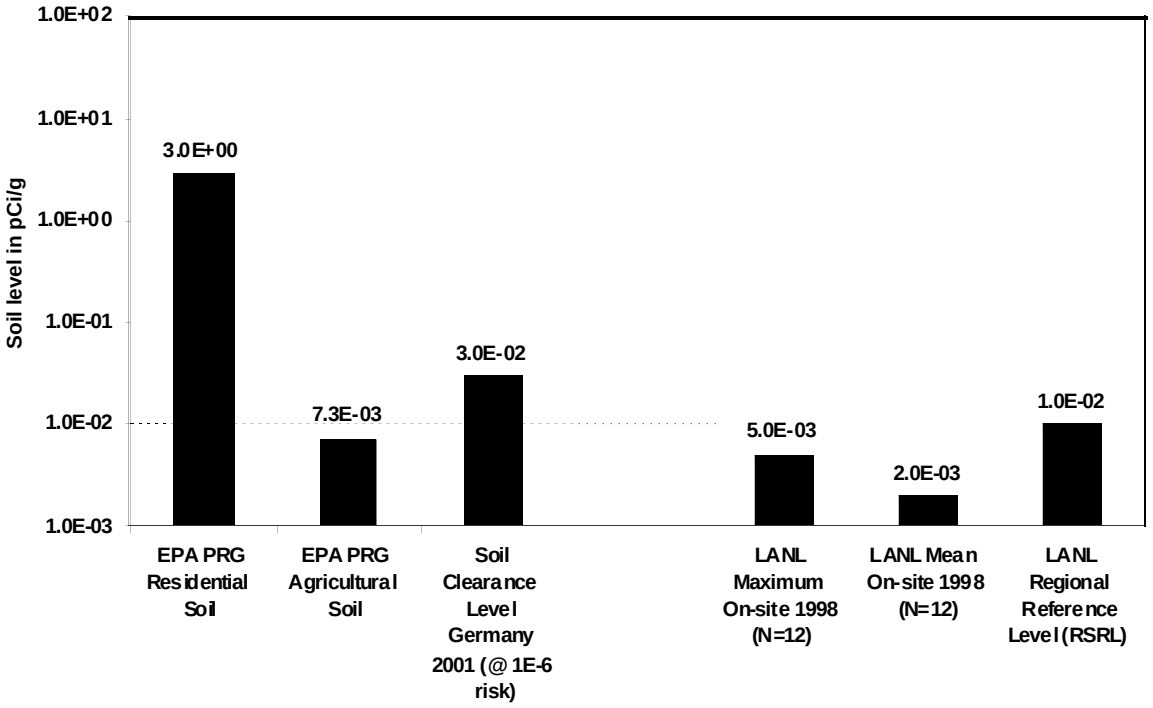

Figure 3. Comparison of remediation goals for plutonium-238 in soil with soil levels reported by LANL

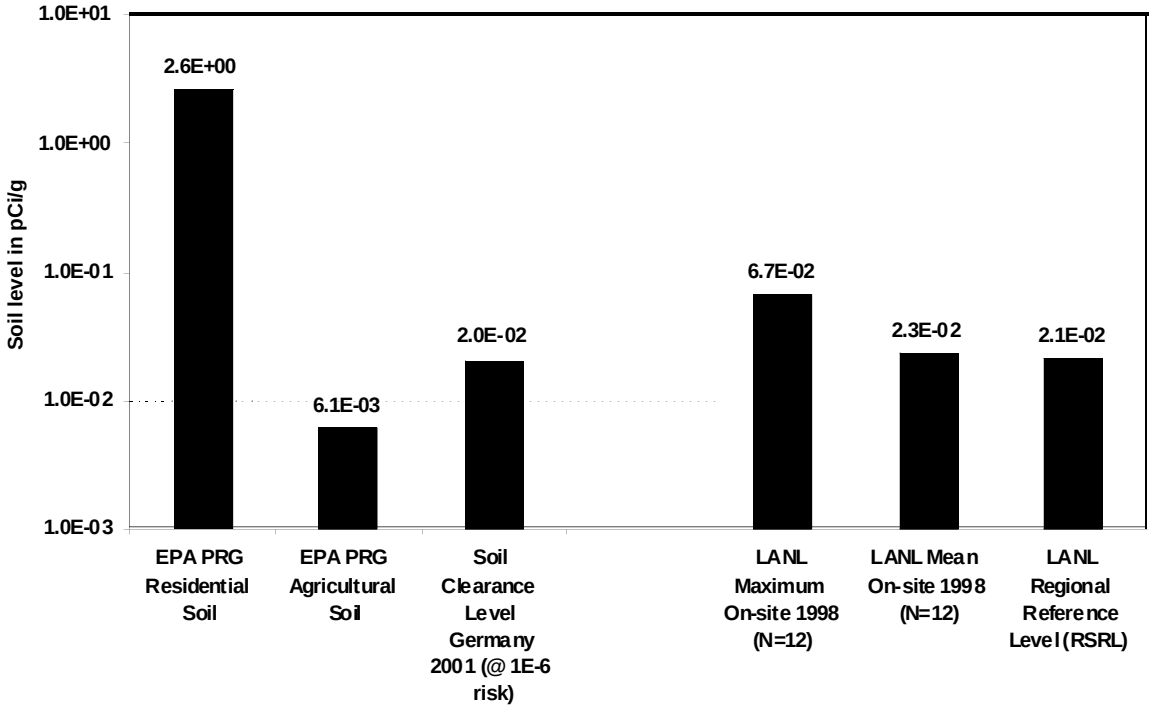

Figure 4. Comparison of remediation goals for plutonium-239 in soil with soil levels reported by LANL

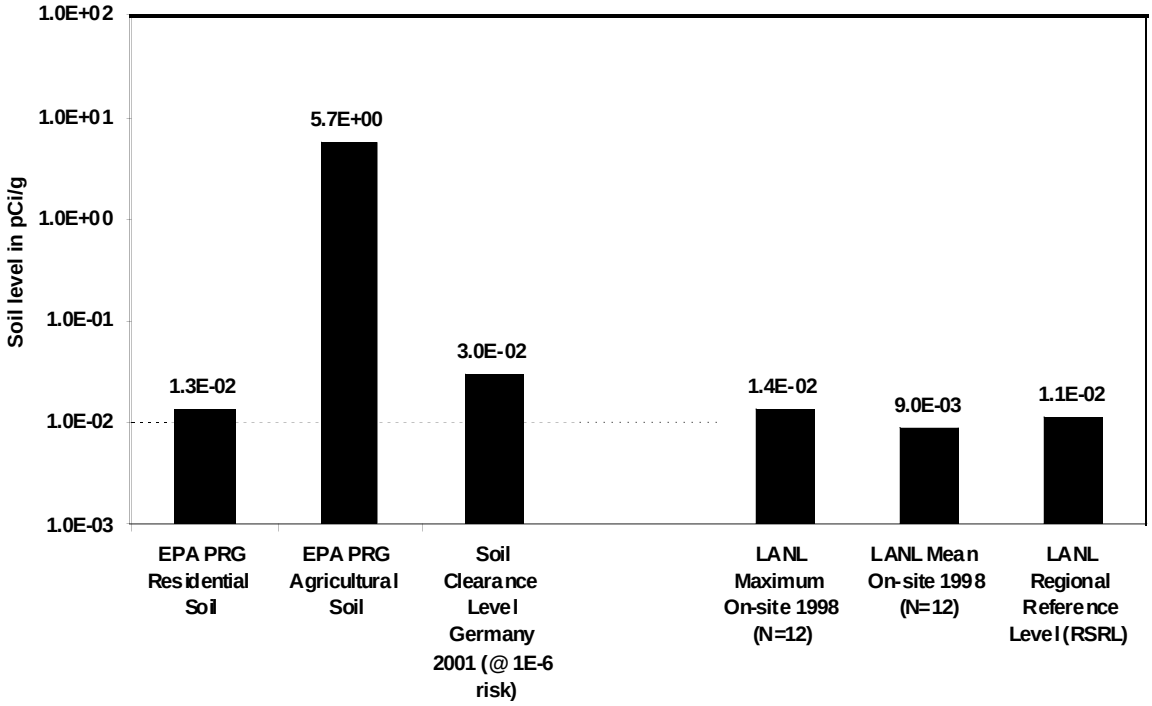

Figure 5. Comparison of remediation goals for americium-241 in soil with soil levels reported by LANL

NMED's Draft Order should contain an outline of the rationale that will be used to resolve such "conflicts in the making". The comparison of values in Figures 1 through 5 also indicate that the "agricultural soil" scenario yields the lowest PRG values for plutonium-238 and plutonium-239. It also shows that the soil clearance values in the current German radiation protection guideline are stricter than the limiting EPA scenario only in the case of strontium-90.

In conclusion, the NMED Draft Order is too unspecific with regard to PRG values. The Order should select the most restrictive usage scenario (residential, agricultural or other) for all substances under review. NMED should further present a rationale to deal with the existing data situation in light of the fact that EPA's existing PRG values are already exceeded, not only for on-site locations but for regional reference values as well.

5. The cleanup levels for Polychlorinated Biphenyls (PCBs) of 1 mg/kg is not strict enough and should be lowered to 0.22 mg/kg. A preliminary screening criterion for perchlorates should be set to 1 part per billion.

NMED has established a default cleanup criterion of 1 mg/kg for PCBs. In contrast, the EPA Region 6 value for PCB is 0.22 mg/kg, based on a risk target of 10^{-6}. We recommend using EPA's stricter value because it reflects the above-mentioned concept of limiting the risk from individual pollutants and is more protective of human and ecological health.

NMED did not set a soil cleanup level for perchlorates, which is not satisfactory given that this is a growing issue at LANL. We are concerned over the possible delays that may occur if EPA does not determine perchlorate soil cleanup levels in a timely fashion. Can NMED, in the Final Order, estimate a date in which EPA will have

determined perchlorate soil cleanup levels? If it can be foreseen that EPA will be long delayed in doing so, the Final Order should set forth as provisional standard.

While the EPA has not yet set a drinking-water standard for perchlorates, NMED has adopted the EPA provisional drinking water equivalent of 1 µg/L or 1 part per billion. We endorse this stringent standard and encourage NMED to make this its permanent standard.

6. The degree of knowledge regarding the risks from radioactive and non-radioactive pollutants should be documented; target values should be continually revised as more information becomes available.

An overall issue with respect to setting appropriate cleanup standards is the fact that knowledge of exposure data and risk factors is constantly increasing. What appears to be a conservative assumption today may be regarded as too optimistic tomorrow. Setting cleanup standards involves judgment of the effects on generations to come. NMED should outline the updating process of risk information.

7. NMED's Draft Order lacks unambiguous definitions for "goals cannot be achieved" (VII.D.3), "implementability" (VII.D.4.b.iv) and "technical infeasibility" of cleanup (VIII.E).

The "LANL Draft Order" stipulates that "if the cleanup standards or goals cannot be achieved, approved risk-based cleanup goals established by a risk analysis" shall be selected as a corrective measure. (VII.D.3) And that "The remedy shall be evaluated for its implementability…" (VII.D.4.b.iv). The Draft Order further states that *"If attainment of the established cleanup level is demonstrated to be technically infeasible, the Respondents may perform a risk-based evaluation to establish alternative cleanup levels for specific media at individual corrective action units."* (VIII.E) These provisions are too vague in nature and open the door for substantial arbitrariness in their application because of the lack of clear and unambiguous definitions. At which point is it impossible to achieve a cleanup standard or goal? What are the limits of implementation? And at what point is attainment "technically" infeasible rather than simply "too expensive"?

We strongly recommend that NMED define a precise and numerical decision criteria process for the above. As a general principle, we further state that in the approval process for future corrective measures NMED must err on the side of ensuring genuine environmental restoration and the needed technical means to get there. NMED should be very skeptical of any economic arguments that the Respondents might raise while seeking approval of alternative methods given the lab's rapid budget growth in other programs while cleanup funding declines.

8. The NMED position paper on human and ecological risk assessment referred to in section VIII.E is deficient. NMED should consider the agricultural use scenario and require a thorough uncertainty analysis.

If a "risk-based evaluation" is conducted, the Draft LANL Order defines that it should be in accordance with the Department's "Human Health Risk Position Paper Assessing Human Health Risks Posed by Chemicals: Screening Level Risk Assessment (March 2000)," while using the equations in the Department's Technical Background Document for Development of Soil Screening Levels.

The quoted document is deficient because it limits the pathway analysis to residential and industrial usage scenarios. Section 6 of the position paper is entitled "Analysis of uncertainties" and merely specifies that the major areas of uncertainty be "discussed". Given the fact that NMED's cleanup levels as well as the PRG values were selected in a deterministic way, there is a significant degree of uncertainty that needs to be properly quantified.

We recommend that Section VIII.E and the position paper be revised to address these shortcomings. There will likely be a significant uncertainty due to sampling and analysis as well as the variability in model parameters. We recommend that NMED's Draft Order require a mandatory full-scope uncertainty analysis of the risk posed by non-radioactive and radioactive pollutants. NMED's Draft Order should require a mandatory full uncertainty analysis of the risk posed by non-radioactive and radioactive pollutants.

Summary

While NMED's overall risk target of 10^{-5} for the sum of all radioactive and non-radioactive pollutants is a reasonable one, the Draft LANL Order contains major inconsistencies and is too vague in a number of cases that were reviewed by us:

NMED's target risk levels allow that the target risk could be exhausted by a single pollutant, which is not standard practice. We recommend that the target risk for individual pollutants (whether radioactive or non-radioactive) should be 10^{-6} and that the target risk level from all pollutants combined should not exceed 10^{-5}. We recommend appending this by limiting the maximum annual dose to 1 mrem/year CEDE.

NMED does not address the issue of collective dose that is a measure of the overall potential harm of residual contamination to the entire population potentially at risk. We recommend that NMED establish a collective dose target risk for radioactive and non-radioactive pollutants.

NMED should provide cleanup values for the agricultural scenario for non-radioactive pollutants.

The NMED Draft Order is too unspecific with regard to PRG values. We recommend that the most restrictive usage scenario (residential, agricultural or other) for all substances under review be selected. Further, NMED should present a course of action to deal with the existing data situation in light of the fact that EPA's existing PRG values are already exceeded for some radionuclides.

NMED has established a default cleanup criterion of 1 mg/kg for PCBs. In contrast, the EPA Region 6 value for PCB is 0.22 mg/kg. We recommend using the stricter EPA value because it reflects limiting the risk from individual pollutants and is more protective of human and ecological health.

A preliminary screening criterion for perchlorates should be set to 1 part per billion.

The knowledge of the risks from radioactive and non-radioactive pollutants is constantly changing. We recommend that NMED's Draft Order should reflect this and provide for a process of continuing revision as more information becomes available.

NMED's Draft Order lacks unambiguous definitions for "goals cannot be achieved", "implementability" and "technical infeasibility" of cleanup. We recommend that NMED define a precise and numerical decision criteria process for the above.

There will likely be significant uncertainty due to sampling and analysis as well as the variability in model parameters. We recommend that NMED's Draft Order require a mandatory full-scope uncertainty analysis of the risk posed by non-radioactive and radioactive pollutants.

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USEPA-2001. U.S. Environmental Protection Agency (2001). User's Guide: Radionuclide Carcinogenicity for the HEAST Radionuclide Table said that they are generally unwilling to extend milestones just to accommodate lower funding levels by DOE.

- End of Mr. Franke's Comments -

Section IX. Investigations and Sampling Methods and Procedures: No substantial comment. NWNM again compliments NMED on its apparent thoroughness.

Section X. Monitoring Well Construction Requirements: No substantial comment. NWNM again compliments NMED on its apparent thoroughness.

Section X. Reporting Requirements: What will be the public's access to critical information, reports and documents, such as risk assessment and corrective action reports, the type of future land use scenarios used, actual screening values used, uncertainty analyses and conclusions and recommendations? How may all of the above be used or incorporated into the LANL RCRA permit renewal process? What is the quality assurance process for both LANL's preparation of the requested information and NMED's review and approval of it?

Section XII. Compliance Schedules Tables: The May 2002 GAO Report "Waste Cleanup: Status and Implications of DOE's Compliance Agreements" states:

> Thus far, regulators [across the country] have generally been willing to negotiate extensions when DOE found itself unable to complete a milestone on time, approving about 93 percent of DOE's requests for milestone changes… However, regulators said that they were generally unwilling to extend milestones just to accommodate lower funding levels by DOE.

Obviously the situation is different here in New Mexico which, to date, has not had such a comprehensive Order with milestones until now. However, we believe that this Order was issued, at least in substantial part, precisely because NMED had witnessed a pattern of serious decline to environmental restoration funding in this state. In effect, NMED was put into a position by DOE of choosing whether or not it would accommodate lower funding levels (and this after the Cerro Grande Fire to boot!). We say out of principle that there should be zero tolerance for missed milestones (other than *force majeure*) to begin with, but especially so in light of the past declining funding pattern. We recommend zero tolerance even in light of the fact that through this Order there is a probability of increased funding.

A further reason for zero tolerance of missing milestones is that cleanup schedule slippages are endemic to DOE cleanup programs. As the June 2002 DOE Inspector General's Audit Report "Environmental Management Performance Measures" states:

> At the 40 cleanup sites still open at the end of FY 2001, the average time to complete cleanup work changed from 11 years in 1998 to 17 years in 2001. These slippages have resulted in an increased duration of 6 years, or 55 percent, with schedule slippages occurring at 32 of the remaining 40 cleanup sites.

This is a situation which NWNM asserts will only grow worse as DOE hits the more intractable problems, which LANL has many. Furthermore, NMED should bear in mind the obvious fact that LANL is and will remain a National Nuclear Security Administration (NNSA) site. The point here is that clearly the NNSA will not have environmental restoration has its highest priority, even as expanded nuclear weapons operations at LANL will increase the volumes of hazardous and radioactive wastes being produced. Finally, NMED and the lab simply need to make up for lost cleanup time. For all of these reasons NWNM urges NMED in the strongest terms to not tolerate missed milestones, but instead to enforce them vigorously with appropriate penalties as needed.

Under the Canyon Watershed Sampling Schedule the final Order should have a requirement for sampling stormwater runoff. The number of samples needed for an adequate statistical analysis should be determined by NMED (and is obviously subject to weather). The samples should be split with NMED.

- End Of Section by Section Comment -

Some General Comments

NWNM again applauds NMED's Determination of Immanent and Substantial Endangerment. Of course, the people who know best what tangible dangers there might be would be LANL personnel. The final Order should incorporate measures that would protect any whistleblowers that might come forward with valuable information.

In our view, NMED should be well aware of other states' Orders, what worked, what didn't and what may be applicable to this Order. We advise NMED that the May 2002 GAO Report "Waste Cleanup: Status and Implications of DOE's Compliance Agreements" has an excellent list by state of Orders and Consent Decrees issued against DOE. The GAO Report also notes that DOE HQ has made no attempt to calculate the costs of compliance with existing regulatory orders and consent decrees by site. While not advising that this should be part of the Order itself, NMED should nevertheless pressure DOE/LANL/UC into calculating projected costs

for complying with the Order so that future compliance can be better assured with a sound fiscal basis.

NWNM finds it ironic that there is much attention being paid by DOE/LANL/UC to "Quick to WIPP," that is to say the transport of monitored and stored transuranic wastes from TA-54 to WIPP. At the same time, there is complete silence on their part concerning the probable larger volumes of transuranic wastes buried across the site. NWNM recommends that the final Order should require continually updated aggregated inventories of waste by their waste type classification, as data is acquired.

One major omission that we find pervading the draft Order is spelled out quality assurance procedures for both those required of DOE/LANL/UC in the fulfillment of data requests, reports, etc. and those for NMED in its review and approval process. We think this subject to be of sufficient stature that it merits having its own section in the final order, at least for DOE/LANL/UC. We don't necessarily think that NMED needs to order itself in the final Order, but nevertheless NMED should self-examine this issue.

NMED should also examine its resource base for supporting the ongoing implementation of this Order and the means whereby it succeeds in consolidating that resource base. [We are not suggesting that self-examination should occur within the final Order, but nevertheless strongly note that it needs urgent redress.] The conventional adage is that the means don't always justify the ends. To be less cryptic, what we mean here is that NMED should be very leery of "snake oil" proposals by DOE/LANL/UC to accelerate "cleanup," in which the feds attempt to lure struggling state environment departments into accepting certain premises that will inevitably compromise the course of future genuine cleanup. To cut to the quick, NMED is already culpable by having cosigned onto the now somewhat infamous Letter of Intent in the hopes of obtaining both greater cleanup funding for New Mexico and its own resource base (both of which are legitimate concerns but can obviously lead to potentially compromising situations).

It is certainly easier now to say that NMED should have never signed that Letter of Intent in light of the Senate Energy and Water Subcommittee's stinging rebuke of DOE's so-called Accelerated Cleanup Account. Not only were appropriations denied for that account, the subcommittee allocated all of DOE's proposed "expedited cleanup" funds directly to the individual sites and expressly barred the DOE Asst. Secretary for Environmental Management from discretionary reallocations. Moreover, the two primary signatories (the DOE Asst. Secretary and the present NMED Secretary) to that Letter of Intent may soon be gone. The point of all of this is that NMED should examine the currency and validity of the Letter of Intent and possibly rule it as invalid and inoperative. NWNM contends that the Letter of Intent was a contract of sorts between DOE and NMED. In the plausible event that Congress as a whole accepts the subcommittee's recommendation then DOE will not be fulfilling that contract as planned. Therefore, NMED should not feel obligated to remain in a position whereby it could possibly be compromised by that ill-advised instrument. Again, NWNM is not suggesting that these deliberations internal to NMED should place within the framework of the Order. Still, we most strongly urge that they do indeed take place.

- End of Comments -

Respectfully submitted,

Jay Coghlan, Director July 31, 2002