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Before the New Mexico Environment Department

February 8, 2008

**Citizen Action Comments Re: Sandia National Laboratories (SNL), New Mexico
March 2006 Request for Corrective Action Complete No Further Action (NFA)
Status
(Class III Permit Modification March 2006)**

Citizen Action is opposed, with a few exceptions, to the list of 26 Solid Waste Management Units (SWMUs) proposed for No Further Action (NFA) at Sandia National Laboratories (SNL or Sandia). Citizen Action requests an evidentiary public hearing in this matter because NMED/SNL originally asserted that this is a Class III Permit Modification (March 2006) to the SNL Resource Conservation Recovery Act (RCRA) Part B Permit.¹ Now the above caption is stated as a request for Corrective Action Complete, but the fact remains that the RCRA Part B Permit must be modified to accomplish this action. The Consent Order for the closure of the SWMUs does not meet the requirements of 40 CFR 270.1(c)(7) for an enforceable document. The SWMUs are actually for the most part “regulated units” that must be closed under the requirements of 40 CFR Part 264 Subparts F and G with well monitoring network requirements in place.

The numerous SWMUs at Sandia include locations where billions of gallons of liquid wastes were disposed of into engineered cisterns, seepage ponds, infiltration trenches, drainlines, etc. The SWMUs are toxic chemical and radioactive waste legacy left from the production of nuclear weapons. Sandia wishes to leave the contamination in place above the most productive portion of Albuquerque’s precious drinking water aquifer.

Indeed, the groundwater may already be contaminated but is unnoticed because of Sandia’s failure to install the reliable networks of monitoring wells that are required by federal law, the laws of New Mexico and Department of Energy Orders.

These SWMUs contain some of the most dangerous contaminants on the planet. There exists no technical basis for the placement of these SWMUs for No Further Action status. In most cases, DOE/SNL can only speculate as to the volume of hazardous wastes, radionuclides and the total volume of liquids that may have been discharged into septic systems, seepage pits. Statistical knowledge of contaminant population is not acceptable to show that a site has been fully characterized with

¹ Citizen Action disagrees that Module IV is a part of the SNL RCRA Part B permit.

respect to Contaminants of Concern (COCs). The vertical and horizontal extent of contamination must be measured with properly installed well monitoring networks at the SWMUs.

The 26 dumps that are currently proposed for No Further Action (NFA) status individually and collectively pose danger to the health of Albuquerque's residents from solvents, metals and radionuclides they will drink, inhale and ingest from the groundwater, air and soil. In order to qualify for NFA status it must be shown that there are no releases. This cannot be demonstrated for the SWMUs at issue.

Many of the SWMUs were designed to dispose of hundreds of thousands of gallons of liquid radioactive and hazardous wastes on a daily basis from Sandia's research laboratories and nuclear reactors.

Many of the unlined, unmonitored SWMUs are described as septic systems with tanks and drain fields. The septic systems carried far more danger than human excrement. A short list of what Sandia plans to leave above Albuquerque's drinking water without groundwater monitoring or remediation are cyanide, hexavalent chromium, arsenic, selenium, cadmium, beryllium, solvents like acetone, toluene, methylene chloride, TCE, PCE, high explosives compounds, dozens of radionuclides like tritium, U-235, U238 and many others radionuclides that are not disclosed, but certainly include isotopes of Plutonium, Americium, Strontium-90, Cesium-137 and others.

During their operating lifetimes, individual SWMUs received discharges of liquid wastes that could annually amount to tens of millions of gallons, but the amounts are most often not provided. Collectively, billions of gallons of toxic radioactive liquid waste has been discharged beneath Sandia without groundwater monitoring networks in place to investigate movement of the contaminants to the groundwater beneath the locations of the SWMUs.

NMED was cognizant in 1997 of the need for groundwater characterization:

“Over 20-30 year periods, the larger discharge rates reported for some of these smaller septic systems appear to be sufficient to drive contaminated liquids to the [ground]water. Additionally, a number of small septic systems are located in canyon or pediment areas where the unsaturated zone is made up chiefly of permeable gravel, sand, and potentially permeable fractured bedrock, and where groundwater is relatively shallow. There is certainly potential in these cases that hazardous constituents such as VOCs and cyanide) can cause ground water to become contaminated to unacceptable levels.”

“Therefore, HRMB will not approve NFA status for any septic system without ground-water characterization...”

The volume of liquid discharges and true nature of the contaminants in these SWMUs are not presented. The dismal absence of record keeping for the liquid discharges demands that groundwater well monitoring networks be provided for the SWMUs.

Unfortunately, adequate characterization of the groundwater has not been achieved for most of the 26 SWMUs. The potential for groundwater contamination from the enormous annual liquid discharges stretching over 50 years is required to be monitored by 40 CFR 264.90-.100 (Subpart F) for closure of these facilities because Sandia is seeking a Part B RCRA Permit. The SWMUs show statistically significant evidence of contamination but lack both detection and compliance monitoring programs required under RCRA 40 CFR 264 Subpart F.

Where monitoring wells do exist they are most often very distant from the SWMU that is to be monitored. In one instance, contamination from a SWMU was “watched for” by a monitoring well TJA-6 that was upgradient from SWMU 46!! Monitoring wells must be at the release sites to measure contamination at the various SWMUs. A specific network of monitoring wells is necessary at the location of each SWMU. Monitoring wells can not be claimed for SWMUs that exist at other locations distant from the release. The monitoring wells have to be close to the release for early detection. That is also required by DOE Orders.

The descriptions of the SWMUs are too vague for the public to determine whether the proposed NFAs are safe. Generally, the Fact Sheet fails to present information such as: exact types of Contaminants of Concern (COCs) and their volumes; the locations of drain fields on maps; the depth of septic tanks, seepage pits, piping, and drain systems; the positions of monitoring wells if they exist; drilling methods; type of well construction; depth to ground water; statistical water sampling data; direction of the flow of groundwater at the SWMU locations; volumes of waste water and the wastes discharged. Typical descriptions of the COCs gives no breakdown for the types of “radionuclides” that are at the various SWMUs. Apparently, Sandia has no intention of protecting the public from radionuclide contamination. DOE Order 450.1 is ignored.

Often, the NFA status relies upon the collection of soil and septic samples at the current time from the SWMU sites that have no bearing on the hazardous wastes that were released over five decades of use and which may already have reached groundwater or have plumes on the way. The knowledge of groundwater contamination does not exist because the required well monitoring networks to detect contamination are not in place.

Sandia’s claims of “characterization” and “remediation” in compliance with state and federal regulations for many of the 26 SWMUs can be viewed at a minimum as gross public deception.

The information provided in the SNL Fact Sheet is quite deficient. The supporting documentation for the SWMUs should have been provided in electronic format or made physically available in Albuquerque.

Sandia is ignoring the importance of compliance with DOE Orders for protection of the public from radioactive contamination. The DOE seeks authorization from NMED to leave the wastes in place at the various SWMUs. If authorization for NFA status is given by NMED, Sandia will never address the protection of the public from the radionuclides contained at the SWMU sites. NMED should file a complaint with the New Mexico Attorney General, the DOE Inspector General and the US Attorney that DOE is failing to comply with DOE Orders 5400.5, 450.1. Sandia has made the claim that it is in compliance with DOE Orders in other documents for closure requirements under DOE Orders. (Corrective Measures Study for the Mixed Waste Landfill May 21, 2003). No such compliance in fact exists.

There is no regulatory authority under RCRA for the SNL RCRA Draft Permit to now include the SWMUs as a part of the RCRA Draft Permit. Neither do the SWMUs qualify for inclusion in the RCRA Draft Permit. Most of the SWMUs were in operation in December 1988 after the September 1988 EPA declaration in the Federal Register that Mixed Waste Landfills would have to comply with Part A and Part B permitting requirements once their State was authorized to regulate mixed waste. The SWMUs received both mixed waste and hazardous waste during the period July 26, 1982 to December 1988 making them “regulated units” under 40 CFR 270.1 and 40 CFR 264.90. On or about July 25, 1990, New Mexico received its authority to regulate mixed waste. SNL never submitted a RCRA Part A application or a Part B application for the SWMUs within the 12 month time period required at the latest by July 25, 1991.

Under the provisions of RCRA, the SWMUs lost or lacked interim status for operation. Owners of land disposal units were required to submit a Part B permit application within one year after the state’s radioactive mixed waste authorization or lose interim status. NMED gained status mixed waste authorization on July, 25, 1990. The SWMUs did not submit a Part B application within one year of that date and lost interim status. The SWMUs was required to immediately close by either clean closure, submitting a post-closure plan, or a document in lieu thereof because it did not maintain interim status and lost interim status if it had it at all. None of this was accomplished and the SWMUs remain as illegally operating units to the present time without a closure plan, post-closure plan and in non-compliance with the provisions of 40 CFR 264 Subpart F. The SWMUs are still required to close under the provisions of 40 CFR 270.1.

The SWMUs requires closure, a post-closure plan and a post-closure permit or an enforceable document “in lieu thereof.” Post-closure plans must be provided for the SWMUs because they are not clean closed. (40 CFR 264.118, 265.118(e)(1) and (2)). No closure by removal or decontamination has been demonstrated for the SWMUs.

Sandia should furnish the regulatory history of each SWMU. Many of the “SWMUs” were actually “regulated units” as landfills under 40 CFR 270.1 (c) that operated to receive liquid or solid hazardous wastes after July 26, 1982.² 40 CFR 260.1 defines a landfill as “a disposal facility or part of a facility where hazardous waste is placed in or on land and which is not a pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, a cave, or a corrective action management unit.”³

At least by 1 year after 7/25/90, when NMED obtained HSWA authority, these regulated units were required to be included on a Part B RCRA Permit application. Otherwise these regulated units were required to clean close or submit a post-closure permit or obtain documents in lieu thereof. (40 CFR 270.1 (c)(7)). There is no evidence in the record here that Sandia complied with RCRA permit requirements or that NMED enforced permit or post closure requirements for these SWMUs. Closure of the “SWMUs” under corrective action (40 CFR 264.101) is an evasion of the clean closure or post-closure permit requirement for these regulated units. Long-Term Monitoring and Maintenance requirements are also being evaded by Sandia by reliance upon the SWMU designation of Module IV that was not effective until 1993.

Generally, the decision to close the 26 SWMUs as needing No Further Action (NFAs) is based on risk assessments that are riddled with insufficient data and instead are statistical manipulation of standards of risk. Albuquerque’s residents require “residential” standard for the quality of their drinking water. Instead, the 26 SWMUs along with possibly hundreds of other SWMUs closed in the past, threaten air, soil and water with the “industrial” standard. The industrial standard leaves the toxic and radioactive wastes in place in the center of a major metropolis of over 600,000 persons. Toxics like polychlorinated biphenyls (PCBs), cyanide, arsenic, mercury, beryllium, depleted uranium, cadmium, hexavalent chromium (Erin Brokovich), lead, toluene, trichloroethene (TCE), tetrachloroethene (PCE), acetone, benzene and dozens of radionuclides of undisclosed types are present.

The industrial standard leaves everyone, especially children, at higher risks of cancer, disease, and birth defects. Sandia has failed to consider the operation of Executive Order

² The regulated units would include SWMUs: #4 (operation until 1992); #49 (occupied until 1988); #52 (operation until 1992); #91 (operation until 1991); #101 (operation until 1994); #138 (1991); #140 (1991); #147 (1991); #149 (1993); #150 (1980s operation); #154 (1993); #161 (1993); #196 (1989); #233 (1993); #234 (until early 1990s); #1090 (until early 1990s); #1094 (still active- RCRA permit in place?); #1116 (still active).

³ 40 CFR 260.10 “Disposal means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.

“Disposal facility means a facility or part of a facility at which hazardous waste is intentionally placed into or on any land or water, and at which waste will remain after closure. The term disposal facility does not include a corrective action management unit into which remediation wastes are placed.”

13045 that requires federal agencies “to identify and assess environmental health risks and safety risks that may disproportionately affect children.”

The industrial level proposed for cleanup of the Sandia SWMUs amounts to leaving the wastes in place and allowing the public to bear the costs of disease and family tragedy. The SWMUs are considered in piecemeal fashion without performing a full risk assessment to present and assess overall risks to the public, workers and environment from cumulative operations at the release sites for air, soil and groundwater pathways. The proposed industrial standard of cleanup for many of the SWMUs does not recognize that the sole source drinking water aquifer beneath SNL must provide a residential standard of drinking water. All SWMUs should be remediated to at least the residential standard to protect Albuquerque’s drinking water from the cumulative risks of these many areas.

RCRA identifies high levels of contamination measured in the boreholes of SWMUs as "Statistically Significant Evidence of Contamination." 40 CFR §264.98 requires for SWMUs with "statistically significant evidence of contamination" a Detection Monitoring Program must be put into place with the following pertinent parts:

"(2) The owner or operator must determine whether there is statistically significant evidence of contamination at each monitoring well as the compliance point within a reasonable period of time after completion of sampling. The Regional Administrator will specify in the facility permit what period of time is reasonable, after considering the complexity of the statistical test and the availability of laboratory facilities to perform the analysis of ground-water samples."

"(g) If the owner or operator determines pursuant to paragraph (f) of this section that there is statistically significant evidence of contamination for chemical parameters or hazardous constituents specified pursuant to paragraph (a) of this section at any monitoring well at the compliance point, he or she must:

(1) Notify the Regional Administrator of this finding in writing within seven days. The notification must indicate what chemical parameters or hazardous constituents have shown statistically significant evidence of contamination;"

"(4) Within 90 days, submit to the Regional Administrator an application for a permit modification to establish a compliance monitoring program meeting the requirements of §264.99. The application must include the following information:

(i) An identification of the concentration of any appendix IX constituent detected in the ground water at each monitoring well at the compliance point;

(ii) Any proposed changes to the ground-water monitoring system at the facility necessary to meet the requirements of §264.99;"

1. **SWMU 4 -- LWDS Surface Impoundments/Liquid Disposal System** consisted of 3 SWMUs that operated from 1963 to 1992 receiving 12,000,000 gallons of radioactive effluent that also contained 17 RCRA listed metals and PCBs, and 9 Volatile Organic Compounds (VOCs) and 7 Semi-volatile Organic Compounds (SVOCs). Coolant water was discharged from the SERF reactor. Coolant water discharges have a history of being contaminated by hexavalent chromium which was present at SWMU 4. PCBs were identified in the southwest corner of Impoundment 2. Especially high values for Beryllium were measured (4.9 mg/kg). The wastes from 1963 to 1967 were pumped to a drainfield, but that is not identified on Figure 3. The drainfield collapsed and wastes were then sent to surface impoundments which are SWMU 4. SWMU 4 disposal site operated illegally by receiving known RCRA listed hazardous waste without obtaining a RCRA permit. A post-closure permit is necessary. The surface impoundments operated from 1967 to 1992. These impoundments required RCRA permits. A single monitoring well LWDS-MW2 was installed in 1992 ~150 ft from the center of the impoundments, but no discussion of the direction of groundwater travel, well construction, development information or monitoring data for SWMU 4 is provided in the December 2007 Fact Sheet/Statement of Basis (SNL March 2006 Request for Corrective Action Complete (No Further Action) Status. The monitoring well does not meet the requirements for point of compliance as described in recent letters from James Bearzi, Chief of NMED Hazardous Waste Bureau. The well has a stainless-steel well screen that is no doubt corroded and not capable of detection of contamination at present. No monitoring wells are at the release site for contamination at SWMU 52. A specific network of monitoring wells is necessary at the location of SWMU 52. Monitoring wells can not be claimed for SWMU 52 that exist at other location distant from the release. The monitoring wells have to be close to the release for early detection. A monitoring network compliant with the requirements of 40 CFR 264.90-.100 is required to be installed at SWMU 4 with at least one upgradient and three down gradient wells. Human and ecological risks are not acceptable to release this SWMU for NFA status.
2. **SWMU 5, LWDS Drainfield** The drainfield is also known as Tank 3. It operated from 1962-1967 and collapsed. It contains VOCs, SVOCs, RCRA metals and radionuclides. SWMU 5 has not been properly investigated for contamination as it must be because SNL is applying for a RCRA permit. A monitoring well TAV-MW6 exists within the boundaries of SWMU 5. The construction of the MW6 is not provided and no data is presented for the well. The MW6 cannot be found in Figure 4.6 Site Map showing Drainfield Monitoring Well. The flow direction of groundwater is not provided. An earlier well, LWDS-MW1 installed in 1992, supposedly shows evidence of releases from the site. The Trichloroethene (TCE) was above the EPA Maximum Contaminant Level (MCL) in water samples collected from well LWDS-MW1. MW1 is also not identified as to its location in the Fact Sheet. Cobalt-60 and Cesium-137 were found in drainfield sampling.
3. **SWMU 46, Old Acid Waste Line Outfall** was an outfall discharge point covering 2.5 acres that connected to several buildings that dumped wastewater into three 700 ft long unlined, earthen ditches. There is no reason for SWMU 46 to be qualified for No

Further Action status at this time. The site has not been properly studied for the remedy decision.

The years of operation of SWMU 46 were from 1948 through late 1974. The location is on the northern rim of the Tijeras Arroyo. The depth to groundwater at this location is critical but not stated. The amounts of discharge during the entire period of operation is not provided. In the 1960s, an estimated **130,000 gallons per day** were discharged into the ditches including VOCs, SVOCs, RCRA metals and radionuclides. The actual amount of discharge of liquid waste should be calculated. 130,000 gallons per day discharge for one year is **48,000,000 gallons per year**. How many years did this continue? What total volume of contaminated waste water was disposed of? What quantity of contaminants were released?

The current condition of the ditches is not sufficiently described nor are they characterized for the wastes in each ditch. The types and amounts of RCRA wastes within the 3 ditches have only been sparsely sampled. Only soil-vapor sampling at two Vapor Wells has been conducted and groundwater monitoring is required due to the significant evidence of contamination present at SWMU 46. There is a claim of a monitoring well TJA-6 but that well cannot be located for SWMU 46 on Figure 5. Direction of groundwater flow is not indicated either. The single groundwater monitoring well, TJA-6 is claimed for SWMU 46, but no information about the construction details, depth of the well or sampling data is provided in the fact sheet. **TJA-6 is greater than 500 ft from SWMU 46** and thus not at the point of compliance for SWMU 46. No data for VOCs is presented from TJA-6. The well is upgradient to the direction of the flow of groundwater because it lies to the south of SWMU 46. Groundwater flow direction is not provided on Figure 18. RCRA requires one upgradient and three downgradient monitoring wells at the point of compliance for SWMU 46. Nor are the locations of where the septic tanks were or the location of the drain fields or the direction for the flow of groundwater is provided on Figure 5. TJA-6 is claimed to be part of the Tijeras Arroyo Groundwater (TAG) monitoring, however the location and details of the TAG well monitoring network is not provided on Figure 5. Nor is there any indication that the TAG network is at the point of compliance for SWMU 46.

The contaminants identified contained mercury compounds, cyanide, 17 VOCs including high levels of Trichlorethene (TCE) in soil gas 115 ft below ground surface, SVOCs, PCBs, RCRA metals, and radionuclides. No RCRA background well with 3 downgradient monitoring wells are in place as required. Abbreviation VCA is used but not in the Table of Abbreviations. September 1994 soil samples were for a storm run-off ditch and did not address the acid waste line discharges. TCE levels from soil vapor sampling at 30 ft depth in 1998 were at 55 ppb by volume. According to another NMED report, Henry's Law predicts a concentration of TCE contamination in groundwater of > 100 ppb, more than 20 times higher than the Maximum Contaminant Level (MCL) for drinking water standards. Soil Vapor sampling from April 2001 through March 2002 showed enormous concentration levels of TCE at levels up to 46,000 ppbv at a depth of 115 ft. These high values are alarming and require serious investigation of contamination in groundwater. At LANL for MDA H measurement of TCE at 2.6 ppb, NMED

demanded a remedy of complete encapsulation. One wonders how NMED can even dream of releasing this SWMU for NFA status with this level of TCE contamination and no groundwater monitoring network in place. This is significant evidence of contamination of the groundwater. A monitoring network compliant with the requirements of 40 CFR 264.90-.100 is required to be installed at SWMU 46 with at least one upgradient and three down gradient wells. This is especially critical given the enormous amount of liquid discharge on a daily basis that was present at SWMU 46. Cancer risks for residential land-use are unacceptable. Human health and ecological risks are not acceptable to release this SWMU for NFA status. A RCRA Compliance Groundwater monitoring program is required for SWMU 46, which lacks investigation of contamination at the groundwater, as defined in the Consent Order.

4. **SWMU 49, Building 9820 Drains, Lurance Canyon** contains RCRA constituents including VOCs, SVOCs, metals, hexavalent chromium, cyanide, High Explosive (HE) residues and radionuclides. There is inadequate characterization of SWMU 49 and it should not be provided NFA status. Potential surface contamination from explosives testing was not included as part of the assessment activities as it should be. The volumes of discharges from a former trailer used as a darkroom and Bldg. 9820 are not described for the period of operation (also undescribed) of the site. Although the site was supposedly selected for groundwater monitoring. Monitoring well CYN-MW5 is remotely located over 1350 ft from SWMU 49. There is no compliance with the requirement for well monitoring at the RCRA point of compliance. Flow direction of the groundwater is not indicated so one can not determine that MW5 was placed correctly. No background monitoring well is present. Even though the monitoring well is too distant from SWMU 49, CYN-MW5 detected **hexavalent chromium** at a level that exceeded the approved regulatory background concentration level. All Barium and one hexavalent chromium concentration exceeded NMED background values. This was statistically significant evidence of contamination and monitoring wells should have been placed at the site of SWMU 49 for detection monitoring at the point of compliance. Contrary to DOE/SNL's assertion, SWMU 49 has not been characterized or remediated in accordance with state and/or federal regulations. The required monitoring has not been performed and there has been no remediation whatsoever.

5. **SWMU 52, Liquid Waste Disposal System (LWDS) Holding Tanks** consists of holding tanks, piping (SWMU 52), a drainfield (SWMU 5) and two surface impoundments (SWMU 4). The tanks were designed to receive liquid wastes from the Sandia Engineering Reactor Facility (SERF) main reactor, experimental facilities, and support facilities. From 1963 until 1971, the system received approximately 19,000,000 gallons of waste water contaminated with approximately 35 curies of radionuclides. Non-radionuclide discharges to the surface impoundments continued until 1992. Contaminants include radionuclides, organic solvents, heavy metals and PCBs. No monitoring wells are at the release site for contamination at SWMU 52. A specific network of monitoring wells is necessary at the location of SWMU 52. Monitoring wells can not be claimed for SWMU 52 that exist at other location distant from the release. The monitoring wells have to be close to the release for early

detection. The volume of wastes discharged by the LWDS during the years 1971 until 1992 is not described. The total years of operation for the LWDS is not described in the Fact Sheet. The actual sources of the discharges are not described neither for the tanks or the surface impoundment. The tanks, drainfield, and surface impoundment received radioactive and RCRA wastes including mercury, VOCs and SVOCs, without logs to record nature, amounts, frequency and activity measurements. The age and ASME qualifications and condition of the tanks is not provided. Surface impoundments operating to receive waste after July 26, 1982 were required to have a RCRA Part B permit. SWMU 52 must be closed as a landfill under 40 CFR 264 Subpart N along with the tanks and collapsed drainfield which constitute landfills.

Eight RCRA listed metals (arsenic, barium, beryllium, cadmium, total chromium, copper, nickel and vanadium) exceeded background values. No statement is provided as to the margin of exceedance. Three VOCs and two SVOCs were detected in soil samples. The amounts detected are not provided. TCE has been detected at the site at concentrations from 12 to 16 ppb along with other organic contaminants, but the extent of the vertical contamination cannot be known unless monitoring wells are installed at the location. Tritium and Thorium-232 exceed background levels. All this is significant evidence of contamination requiring groundwater compliance monitoring under 40 CFR 90-.100. No groundwater wells are in place as required. A monitoring network compliant with the requirements of 40 CFR 264.90-.100 is required to be installed at SWMU 52 with at least one upgradient and three down gradient wells. The assertions that the site has been characterized and remediated are fatuous. Cancer risks for residential land-use are unacceptable. Human and ecological risks are not acceptable to release this SWMU 52 for NFA status. SWMU must be characterized and have groundwater monitoring at the dumpsite.

- 6. SWMU 68, Old Burn Site** The 6.5 acre site is poorly described for the numbers of tests that were performed, the volume and types of wastes produced, and the amounts of contaminated water disposed of at the site over 14 years of operation from 1965 to 1978. Although some remediation activities have been conducted for radiological constituents, the RCRA Facility Investigation confirmatory sampling methods and results are not presented with respect to how sampling was accomplished, where it was performed, and depth of sampling. There were pool fire tests conducted at this site. Water remaining after the burns was drained to the southwest of the facility. Beryllium, depleted uranium, thorium and magnesium was present in some of the weapons tested. Four soil samples taken in 1989 (Table A-1 p. A3) show the presence of Pu-238, Pu-239 and Am-241, Sr-90, K-40, Cs-137, Ba, Pb, As and Be. Removal for lead was performed but the possible presence of transuranics left at the site is not discussed. The site is above the acceptable risk value for residential use. The groundwater pathway for contamination was not considered. Groundwater depth is estimated to be 123 ft bgs. An appropriate network of monitoring wells must be installed at SWMU 68. Wind, surface run-off, food chain uptake and transformation/degradation with ingestion, inhalation and dermal-direct gamma exposure are all possible. No data exists on the food chain uptake although numerous

contaminants are cited for bioaccumulation at VII.2.1. Only modeling has been performed without collection of field data and the HQs for plants exceeded unity for arsenic, barium, thallium and vanadium. A HI of 56 was modeled for the deer mouse. At VII.3.5 it is stated that “Many uncertainties are associated with the characterization of ecological risks at SWMU 68.” The uncertainties include assumptions and the use of maximum measured concentrations to evaluate exposure and risk. All this contradicts the statement by SNL that risks are expected to be low for this site.

The coverage for RCRA contaminants beneath the site is less than persuasive given that six VOCs and five SVOCs were detected but without data respecting the levels and the depth of contamination. Jet petroleum-4 fuel was used for burn tests. Is a plume of jet fuel present in the regional aquifer from spills or dumping excess fuel? The fact that excess cancer risks are unacceptable for residential use requires that the details from investigation be more fully presented to the public. Although “predictions” of risk to the deer mouse are considered there is no field data presented for either plants or animals for actual exposure. This site should be more fully characterized including a network of groundwater monitoring for possible RCRA contamination that may exist beneath the site due to continuous volumes of water being released during testing events.

- 7. SWMU 91, Lead Firing Site** conducted testing from 1962 through the late 1980s releasing a large mass of lead as part of the testing. This 20 acre site disposed of wastes into 1) the Test Trench Disposal Area 2) the Southern Burial Area and 3) the Northern Burial Area. This 20 acre site amounts to multiple landfills operating to receive waste after July 26, 1982 that was required to have a RCRA Part B permit. SWMU 91 must be closed as a landfill under 40 CFR 264 Subpart N as a landfill. Numerous burial sites exist within the 20 acre dump. Groundwater monitoring is required as part of that closure. The number of tests performed involving the masses and types of material are not provided. The mass of differing materials used in the tests needs to be quantified.

The lead, arsenic, beryllium, cadmium, selenium, silver, barium and chromium were detected “above background values.” It must be presented how far above background values all of the RCRA metals were detected. No subsurface testing has been performed below a depth of 5 ft although contamination with RCRA metals and radionuclides such as U-235, U-238 Cs-137, Thorium-232 have been detected in these samples.

Contamination must be investigated at depths greater than 5 ft as tests were conducted in a trench 6 to 8 ft deep. Testing and monitoring at greater depths is required under RCRA to determine if groundwater contamination is present. The travel of the fine particulates of RCRA metals and radionuclides into the air pathway should be, but is not considered. Figure 10 does not provide the proximity to lands that are offsite of SNL. Figure 10 shows no sampling locations at the site of SWMU 91. Testing of the offsite lands to the west and south should be required due to the proximity of this site and the lengthy period of explosive operations that volatilized numerous RCRA metals and radionuclides and may have resulted in off-facility deposits. The ecological risks stated for SWMU 91 are not based on factual field data from plants and animals. The proximity of five other

SWMUs should be examined as to the potential for enhanced migration of contaminants and cumulative risk from all the five SWMUs. Cumulative risks from the five SWMUs in close proximity need to be considered. Cancer risks for residential land-use are unacceptable and need to be quantified for all the contaminants identified and remaining at the site. SNL is contaminating water to be used for residential purposes at an industrial level of contamination at SWMU

8. **SWMU 101, Building 9926 Explosive Contaminated Sumps and Drains** in the Coyote Test Field area had 3 seepage pits and a dry well that operated from 1967 to 1991. This is a RCRA regulated unit without monitoring wells. The volume of liquid discharges to the sumps and drains from Building 9926 and the explosive room in Building 9926A need to be described by volume of liquid wastes or the amount of the contaminants. Distance to groundwater is not described for the location. “Seepage pits” are present. The nearest groundwater monitoring well is ~0.7 mi southwest of the site. But the direction of the flow of groundwater “is believed to be” generally to the west northwest in the vicinity of this site. The dump received RCRA contaminants illegally without a RCRA permit. SWMU 101 must have network of monitoring wells put in place because releases have been identified that include VOCs, SVOCs, cyanide, chromium and selenium. Methanol, TCE, toluene, acetone and isopropyl alcohol, hydrochloric, nitric and sulfuric acid along with high explosive compounds were handled. Operational records were not available. High levels of PCE was identified in soil gas. Tritium is above background levels although the amount is not described. U-235 and U-238 are above background levels. Groundwater monitoring has not been performed to further characterize the possible movement of this contaminant. The depth of soil samples has been shallow to no more than 26 ft. Testing has been at a sparse number of locations. The information presented for soil sampling only says what was tested for- not the levels that were found. A monitoring network compliant with the requirements of 40 CFR 264.90-.100 is required to be installed at SWMU 101 with at least one upgradient and three down gradient wells. Significant evidence of contamination is present for PCE. Estimates of the risks at SWMU 101 cannot be properly estimated given the lack of RCRA required well monitoring. The ecological risks stated for SWMU 101 are not based on factual field data from plants and animals. Human and ecological risks are not acceptable to release this SWMU for NFA status because there is insufficient data to characterize the site.
9. **SWMU 116, Building 9990 Septic System** in the Coyote Test Field does not identify the use of Bldg. 9990 and the volume of waste water and quantities of contaminants that discharged. Bldg. 9990 operated from 1971 to ~1994 and discharged RCRA metals, hexavalent chromium, cyanide, PCBs, High Explosive compounds, VOCs, SVOCs and radionuclides to a septic tank and seepage pits. SWMU 116 has a groundwater monitoring well CTF-MW1 that is 500 ft from SWMU 116. CTF-MW1 is too far for the point of compliance for a monitoring well. Although the monitoring well is 500 ft from the SWMU to the south samples show that selenium was detected in seven of eight groundwater samples above background levels. No background well is present for SWMU 116. No flow direction is indicated on the Fig. 13 to determine if CTF-MW1 is downgradient from SWMU 116. No RCRA well

monitoring network of 1 upgradient and 3 down gradient is in place despite the significant evidence of contamination, especially given that selenium could be entering the groundwater beneath the SWMU. The claim that risk is acceptable is unsupported given the lack of a RCRA well monitoring network to characterize the contamination in the groundwater at SWMU116. Human and ecological risks are not acceptable to release this SWMU for NFA status.

10. SWMU 138, Building 6630 Septic System. SWMU 138 received RCRA metals, High Explosive compounds, VOCs, SVOCs and radionuclides from its construction in 1959 until ~1991. The SWMU has not been adequately characterized for NFA status. Since it received hazardous waste after July 26, 1982 a RCRA permit was required but not obtained for SWMU 138. SWMU 138 is required to close with a post-closure permit. The aqueous discharges from Bldg. 6630 are not described for volume or types of waste constituents. Septic Tank sampling detected PCBs. Soil sampling was only conducted to a depth of 16.5 ft. The soil samples detected three VOCs, three SVOCs three RCRA metals above approved background levels. Although “statistically significant evidence of contamination was detected at SWMU 138, no groundwater monitoring has been conducted for the site although compliance monitoring is required under RCRA. The claim that risk is acceptable is unsupported given the lack of a RCRA well monitoring network to characterize the contamination in the groundwater at SWMU 138. Human and ecological risks are not acceptable to release this SWMU for NFA status.

11. SWMU 140, Building 9965 Septic System, Septic Tanks, and Drainfields The abandoned drain systems and seepage pit and drywell are not described as to depth. The volume of discharges to the areas are not described. The drain systems and seepage pit and drywell received RCRA hazardous waste without obtaining a permit. No well monitoring has been provided as should be because significant evidence of contamination exists at the site. Four VOCs, cyanide, three RCRA metals and U-235 and U-238 were detected in soil samples. Septic tank sampling identified VOCs (TCE), pesticides, cyanide, oil and grease. Well monitoring with upgradient and downgradient monitoring wells are needed at both the locations of the seepage pit and the drywell. The two sites are separated by approximately 125 ft. The data to evaluate risk is not present. The five assessment investigations do not provide the necessary knowledge to characterize nature and extent at the site for potential or existing contamination of the groundwater.

12. SWMU 147, Building

RCRA metals, VOCs, HE were received by this site from 1959 to the late 1980s during the period that a permit was required to operate. Three drainfields were present. There are no monitoring wells present. The amount of liquid discharge is not provided. The long period of use indicates that substantial contamination was received for liquid waste and could have entered the groundwater at this location. Collecting septic samples at this time has no bearing on the wastes that were released over several decades of use. The depth to the groundwater is not stated. The sampling was done at shallow levels. Most of the data is over a decade old and does not include necessary groundwater monitoring data.

The claim that risk is acceptable is unsupported given the lack of a RCRA well monitoring network to characterize the contamination in the groundwater at SWMU 147. Human and ecological risks are not acceptable to release this SWMU for NFA status.

13. SWMU 149, Building 9930 Septic System

operated from 1961 to ~1993. Discharge volumes are not provided. This was a RCRA regulated unit and needs to close under post-closure requirements. Contaminants of Concern are VOCs, SVOCs, High Explosive compounds, RCRA metals, hexavalent chromium, cyanide and radionuclides. Tritium was detected above background values. Most data collected is from 1994. A groundwater monitoring well CTF-MW3 is installed more than 300 ft away from SWMU 149 as shown by Figure 18. MW3 is not at the RCRA point of compliance. MW3 detected five VOCs, RCRA metal selenium, cyanide. The levels of detection for the five VOCs are not provided. The data necessary to evaluate risk for SWMU 149 is not provided. Compliance monitoring is necessary because contaminants were detected and the well is 300ft away. It is unknown if well MW3 is downgradient of SWMU 149. Even if downgradient, the distance of the monitoring well MW3 from SWMU 149 is too great. No basis exists for providing NFA status.

14. SWMU 150, Building 9939/9939A Septic System, Septic Tanks and Drainfields

operated from 1974 to the early 1990s. Discharge volumes for liquid waste are not provided in the Fact Sheet. A Work Plan for Bldg. 9939A stated that estimated effluent discharge rates ranged from 20 to 400 gallons per day. Assuming a 5 day-per-week, 50 week-per-year operation, the total amount of effluent discharged from the facility would have ranged from 80,000 to 1,600,000 gallons. (Responses to Comments January 1997, p. 12) This was a RCRA regulated unit and needs to close under post-closure requirements. No monitoring wells exist at the site. Depth to groundwater is not provided for the location. Contaminants of Concern are RCRA metals, PCBs, VOCs, SVOCs, and radionuclides. Four VOCs were detected in soil samples, but no data is provided for the detection levels. "A deep sample was not collected from the seepage pit. (The maximum sample depth was only 8 ft) or the drainfield (the maximum sampling depth was only 4 ft." (Responses to Comments January 1997, p. 13). Groundwater monitoring wells need to be installed at this site. The nearest groundwater monitoring well, CTF-MW2 is approximately 1,950 ft northwest of the site. (Risk Assessment Report for DSS SWMU 150, p. 2-1). The data for SWMU 150 is over a decade old. Monitoring well data needs to be provided before closure of SWMU 150. A septic leachate plume considered to exist was not investigated for its extent. No information is provided for the radionuclides detected.

The claim that risk is acceptable is unsupported given the lack of a RCRA well monitoring network to characterize the contamination in the groundwater at SWMU 150.

15. SWMU 154, Building 9960 Septic System, Septic Tanks and Drainfields

SWMU 154 is located in the Coyote Test Field and operated between 1965 and ~1993. SWMU 154 is a regulated unit and requires a post-closure permit. This was a drain system for high level explosives waste that included approximately six seepage pits. A March 1,

2006 NMED notice RE: Fee Assessment and Notice of Approval states that a new seepage pit was discovered next to SWMU 154 showing high concentrations of high explosive compounds especially 2, 4, 6 trinitrotoluene. It is not clear what the outcome of this matter was. Was the new SWMU named as required and a fee for review assessed?

The liquid discharges included RCRA metals, hexavalent chromium, cyanide, High Explosive (HE) compounds, VOCs, SVOCs, and radionuclides. The volumes of liquid discharges are not provided. A groundwater monitoring well CTF-MW2, installed in 2001, is more than 250 ft from the center of SWMU, over 400 ft from the septic system and does not meet RCRA point of compliance requirements. The borehole for the well was drilled to 190 ft bgs (below ground surface) but the borehole caved in up to 135 ft bgs. Groundwater rose to 44 ft bgs after the well was installed. One does not know if there was a perched water zone present to explain the rise in groundwater or if the depth to groundwater is very shallow at this location. The well was not repaired or replaced, no details are given about the original construction or the reliability of sampling from the well. The direction of the flow of groundwater is not provided. The data from this monitoring well is too questionable to form any basis for risk assessment.

It is concluded by Sandia that “For both the industrial and residential land-use scenario, the total HIs and estimated cancer risks are not acceptable (Table 16).” But then comes Sandia’s statistical juggling act and lo and behold SWMU 154 becomes safe for industrial usage, but still not for residential usage. There is no basis for providing NFA status to SWMU 154. The appropriate groundwater investigation must be provided with 1 upgradient and minimum of 3 downgradient monitoring well network.

16. SWMU 161, Building 6636 Septic System

Received RCRA metals, hexavalent chromium, cyanide, VOCs, SVOCs and radionuclides from 1971 to ~1993. The septic system is a regulated unit. The volumes of liquid discharges are not provided. Depth of the septic tanks and the drainfields is not provided. Eight RCRA metals were detected in septic sludge. VOCs, and cyanide were detected in soil samples from 1994. Data for SWMU 161 is more than a decade old. No monitoring well network exists for SWMU 161 to determine if releases to groundwater occurred. Depth to groundwater is not provided.

There is no basis for providing NFA status to SWMU 161. An appropriate groundwater investigation must be provided with at least 1 upgradient and 3 downgradient monitoring well network.

17. SWMU 196, Building 6597 Cistern

This 25 ft diameter concrete-walled tank has only an unlined earthen bottom 22 ft bgs. The Cistern operated from 1978 to 1989 and received waste from the PROTO 1 facility that tested radiation effects on weapons and instruments. It also received waste as an emergency catch basin from a series of other underground storage tanks. No records of discharges were maintained. Contaminants include total petroleum hydrocarbons (TPH), VOCs, SVOCs, RCRA metals and radionuclides. Data from soil sampling shows that TPH was found at high levels of 60,500 mg/kg. U-235, U-238 and tritium were detected

above background values from the bottom of the Cistern. Five VOCs were detected. A larger drill rig was used to collect samples from 300 ft bgs and 20 ft west of the Cistern. Nine VOCs such as Tetrachloroethene (TCE), Toluene, Xylene, Methylene Chloride and six SVOCs were detected at that depth. The distance to groundwater is not provided. There is a release of contamination from the Cistern that requires groundwater monitoring wells to be placed at the site. No groundwater monitoring currently exists for the Cistern despite the TPH, VOCs and SVOCs found at a great depth below the Cistern. Backfill of the Cistern does nothing to stop the plume of contaminants that are headed for the groundwater. There is no basis for providing NFA status to SWMU 196. This is a chemically and radioactively contaminated site with the potential to contaminate the groundwater and with no monitoring in place. An appropriate groundwater investigation must be provided with at least 1 upgradient and 3 downgradient monitoring well network. Sandia provides no information as to what radionuclides were found at the 300 ft depth.

No NFA Status should be provided for SWMU 196. The SWMU needs to be remediated under post-closure mechanisms as a regulated unit.

18. **SWMU 223, Storm Drain System Outfall** Citizen Action does not oppose this NFA.
19. **SWMU 224, Storm Drain System Outfall** Citizen Action does not oppose this NFA.
20. **AOC 1090 Characterization** is not sufficient for this SWMU. Contaminants detected include VOCs, SVOCs, RCRA metals, barium, cyanide, U-235. The SWMU has no groundwater monitoring well. The amounts of discharges are not set forth. The SWMU operated from 1959 to the early 1990s and was thus a regulated unit that must be closed with long-term monitoring in place. This SWMU is not sufficiently characterized for NFA status and the description of operations requires groundwater monitoring.
21. **AOC 1094 Live Fire Range East Septic System Lurance Canyon** This system began discharges in 1983 and is still active. It is illegally operating without a RCRA permit. The COCs include RCRA metals, hexavalent chromium, cyanide, HE compounds VOCs, SVOCs, PCBs, and radionuclides. By what rationale is SNL and NMED proposing to close this operating landfill without groundwater monitoring being conducted? This SWMU is not sufficiently characterized for NFA status and the description of operations requires groundwater monitoring.
22. **AOC 1095 Building 9938 Seepage Pit (Coyote Test Field)** The seepage pit operated from 1971 to possibly August 2005. Operational history is not provided as are the amounts of discharges. No monitoring well is present. COCs are RCRA metals, hexavalent chromium, cyanide, HE compounds VOCs, SVOCs, PCBs, and radionuclides. This SWMU is not sufficiently characterized for NFA status and the description of operations requires groundwater monitoring.
23. **AOC 1114 Building 9978 Drywell** is still an active facility receiving discharges from a sink in Bldg. 9978. This is currently used as a shop and storage facility to support the ER field project operations. No RCRA groundwater monitoring is apparent for operation from 1971 and the amount and type of discharges have not been provided by the Fact Sheet. The operational history for COCs includes RCRA

metals, hexavalent chromium, cyanide, HE compounds VOCs, SVOCs, PCBs, and radionuclides. This SWMU is not sufficiently characterized for NFA status and the description of operations requires groundwater monitoring.

24. **AOC 1115 Former Offices Septic System** served the headquarters for the Solar Tower Complex. The site operated from approximately 1976 to 1979. Citizen Action does not challenge this NFA.
25. **AOC 1116 Building 9981A Seepage Pit** was constructed in 1981 and is currently active to receive cooling water from occasional tests conducted in Bldg. 9981A. COCs are RCRA metals, hexavalent chromium, cyanide, HE compounds VOCs, SVOCs, PCBs, and radionuclides. This facility is operating illegally without a RCRA Part B permit. It cannot be closed as a SWMU. It requires an operating permit, a closure plan, post-closure permit and a long-term groundwater monitoring network.
26. **AOC 1117 Building 9982 Drywell, Solar Tower Complex** is an abandoned drywell 4 ft in diameter and 11 ft deep. The condition of the drywell is not described to know if the well is even covered. COCs are RCRA metals, hexavalent chromium, cyanide, HE compounds VOCs, SVOCs, PCBs, and radionuclides. The drywell was constructed in 1980 and ceased receiving liquid wastes by August 1999. The drywell is thus a regulated unit that must close with groundwater monitoring. The SWMU is one of five shallow groundwater DSS sites that had 2-butanone soil sample concentrations above the 10 microgram/kg VOC trigger level specified in the DSS SAP. This SWMU is a regulated unit and does not qualify for NFA status. The description and history of operations and contamination requires groundwater monitoring for the COCs.

Respectfully submitted,

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