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BEFORE THE
ATOMIC SAFETY AND LICENSING BOARD
U.S. NUCLEAR REGULATORY COMMISSION

In the Matter of ROCKWELL INTERNATIONAL CORPORATION Rocketdyne Division (Special Nuclear Materials License No. SNM-21)	Docket No. 70-25-ML ASLBP No. 89-594-01-ML

FULL EVIDENTIARY STATEMENT PREPARED BY JON SCOTT, INTERVENOR

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Introduction

As a resident living and working approximately 2.6 miles from Rocketdyne's Santa Susanna Field Laboratory (SSFL) and the Nuclear Regulatory Commission (NRC)-licensed Hot Laboratory, I became aware of the SSFL and their problems through the Department of Energy's preliminary environmental survey report in May, 1989. My concerns in this proceeding are for the health, safety and well-being of my family and myself. To this extent I requested, at the September 9, 1989 hearing held in Los Angeles presided over by Judge Peter B. Bloch, that Rocketdyne's pending application of renewal be denied. At the hearing Judge Bloch granted me intervenor status on the basis of my interests in the matter. Those interests will be addressed in the following discussion.

DISCUSSION

I

ROCKETDYNE'S ENVIRONMENTAL MONITORING EQUIPMENT IS WOEFULLY INADEQUATE.

Title 10 of the Code of Federal Regulations (CFR) Part 70.23(a)(3) provides that: "An application will be approved if the Commission determines that: . . .(3) The applicant's proposed equipment and facilities are adequate to protect health and to minimize danger to life or property." Rocketdyne claims that their equipment to monitor all facets of the operation of the SSFL is adequate and in compliance with NRC rules and regulations. Their burden of proving this claim has never been met. According to an Environmental Protection Agency (EPA) report "The laboratory apparently has never had a thorough review or audit by RI (Rockwell

International) or DOE." (Exhibit 1: "Memorandum to Daniel Shane," Gregg Dempsey p. 2).

There are several areas of concern regarding the inadequacies of their monitoring equipment. The validity of their air monitoring system is questioned. The lack of a meteorological tower on site and the use of the Burbank Airport tower data which is miles away from the site could result in an inaccurate dose of assessment in the event of a release. "SSFL uses the EPA code AIRDOS to define dose to affected offsite areas. However, the tower information used is from the Burbank Airport. Better AIRDOS information could be generated with a closer-to-site or onsite met tower." (Dempsey Memo, p. 7-8)

There are inadequacies in construction of the groundwater monitoring wells which could result in questionable data. The use of centrifugal vane type pumps can cause off-gassing of volatile organic compounds. The analyses would be reduced during the sampling process as a result. (Department of Energy, Enviromental Survey Preliminary Report, February, 1989, at p. 3-71). The validity of water samples is questionable due to the fact that Rocketdyne states that their counter can detect 50% or 2 dpm/cpm (two disintegrations per minute per count per minute). The manufacturer of the counter has stated that the counter can "only guarantee 45-47%." (Dempsey Memo, p. 3). While this may appear a trivial difference, taken together with the deficiencies in Rockwell's monitoring procedures there is the potential for a significant distortion of Rockwell's environmental data.

Appropriate equipment within the laboratory for soil sampling is also in question. (See the discussion regarding soil sampling procedures below.)

In addition, the equipment at the Area II Hazardous Waste storage site for container movement is inadequate. "Equipment used by site personnel for

container movement is not adequate and, on occasion, waste containers have been dropped during movement." (DOE Report, p. 4-14). Since these containers have been exposed to the elements, some have bulged. If the containers were to be dropped by the faulty equipment the contents of the hazardous waste containers could be released to the environment. The storage facility "does not contain sufficient impervious paved area with impervious dikes to allow proper segregation of incompatible wastes or adequate aisle spacing for unimpeded access to containers for inspection and movement. Waste containers are stored on unpaved surfaces."(DOE Report, p. 4-14).

These waste containers do not comply with the specific procedures set out in 10 CFR 20.205(b)(1). Part 20.205(b)(1) provides that each licensee shall monitor the external surfaces of the package for radioactive contamination caused by leakage of the radioactive contents. The DOE findings indicate that Rockwell is not in compliance with the nuclear regulations that were created to protect public health.

According to 10 CFR 70.31(d), "[N]o license will be issued by the Commisssion to any person within the United States if the Commission finds that the issuance of such license would . . . constitute an unreasonable risk to health and safety to the public. Given the above information regarding faulty monitoring equipment, it is clear that renewal of Rockwell's license constitutes an unreasonable health and safety risk.

II

THE QUALITY ASSURANCE PROGRAM OF SSFL IS DEFICIENT

10 CFR 70.22 (f) provides that "[e]ach application for a license to possess and use special nuclear materials in a plutonium processing and fuel

fabrication plant shall contain . . . [(f)] a description of the quality assurance program to be applied to the design, fabrication, construction, testing and operation of the structures, systems and components of the plant." Appendix B to 10 CFR 50 states that these structures, systems and components are to "prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public." It is clear that these regulations apply to Rockwell's facility. 10 CFR 70.4 defines a plutonium processing and fuel fabrication plant" as a plant which conducts, inter alia, "(iv) recovery of scrap material . . . or (2) research and development activities involving any of the operations described in paragraph (r)(1) of this section . . ." (See Memorandum and Order, dated December 1, 1989.)

Rockwell has failed to comply with these requirements by failing to implement aspects of its quality assurance (QA) program and by failing to incorporate other standard QA requirements. (Exhibit 2: Berger, J. D., Review of Surplus Facilities Radiological Monitoring Santa Susana Field Laboratories, December 12, 1989, Oak Ridge Associated Universities (ORAU), p. 9, hereinafter referred to as the "ORAU Report"). For example, the ORAU Report states that (1) "a chain-of-custody procedure for samples has not been implemented; (2) "Although the SSFL procedure requires documentation of personnel qualifications for the various program activities, records supporting training and certification in specific laboratory and field survey procedures could not be provided;" (3) the frequency of internal audits required by 10 CFR 50 Appendix B sec. XVIII is not specified (p. 9); and (4) "Although samples for tritium and some other specific nuclide analyses are performed by a commercial laboratory, Rockwell does not include quality control samples (spikes, blanks, and duplicates) to evaluate the

performance of such vendors."(p. 10) In addition, the DOE states that "[t]here is a lack of formalized procedures for confirming the analyst's calculations and entry results into the computer data base." (DOE Report, p. 4-39). These are all indications that standard operating procedures have not been prepared for all activities at the SSFL and that all activities are not in compliance with 10 CFR 70.22(f) and 10 CFR 50 Appendix B.

Inadequacies in the QA program are further exacerbated by deficiencies in staffing. There is a lack of provisions for a complete backup should the site radiological monitoring staff be absent. Cross training in laboratory activities has not yet been initiated. These deficiencies are especially critical due to the fact that the major portion of the radiological monitoring responsibilities are in the hands of only three staff members. (ORAU Report, p.4).

A QA program is essential to the protection of the environment and public health and safety. Rockwell's quality assurance program is clearly deficient in many important respects and its failure to comply with 70.22(f) is only one of many indications that Rockwell cannot be entrusted with highly volatile nuclear material. By way of relief we therefore request that the renewal of Rockwell's license be denied.

III

MONITORING PROCEDURES TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE ARE INADEQUATE

NRC rules and regulations require that Rockwell's proposed procedures protect health and minimize danger to life or property. 10 CFR 70.23(a)(4). In light of these requirements and new findings by the DOE and EPA (see the DOE Report and Dempsey Memo), it is troubling that Rocketdyne continues to

assert that all of its releases of pollutants and contaminates in air, soil or water are within NRC requirements. If all of Rockwell's releases are within NRC limits, why then does the DOE anticipate that $32 million dollars will be necessary to fully clean up and decontaminate the SSFL of its major pollution? (Exhibit 3: Pearlman, Donald W., Department of Energy San Francisco Operations Office, Summary of Environmental Restoration and Waste Management Plan Provisions Relevant to the Santa Susana Field Laboratory, p. 3)

Rockwell's contaminated Hot Cell Laboratory is a prime example of Rockwell's failure to minimize health risks. The Hot Cell Laboratory is a Priority One clean-up item. A priority one definition is defined as those "activities necessary to prevent near-term adverse impacts on workers, the public, or the environment. . ." (Pearlman, p. 2). How else can a "near-term" risk be viewed except as one that should be taken care of now? If Rocketdyne's license is renewed what assurance do I have that this "near-term" risk Priority One clean-up item will be decontaminated in the very near future? To suppress my concerns and the concerns of others regarding the Hot Cell Laboratory this clean-up should take place now and new projects should not be allowed to be conducted. What assurances do I have that the new project, TRUMP-S, will not cause further contamination and detriment to the environment? These questions have not been sufficiently answered by Rocketdyne. To the extent that Rockwell has not cleaned up the contaminated Hot Cell Lab, allowing Rockwell to renew their license would jeopardize health and safety.

Several areas of concern with respect to the monitoring procedures have been shown to be inadequate. Dempsey concludes in his memorandum, after spending two and a half days reviewing Rockwell's environmental

documentation and a day and a half at the SSFL reviewing procedures and performing an environmental survey with a hand-held radiation gun, that "certain problems exist within this laboratory that make me question the validity of some, if not all, of their environmental data." (Dempsey Memo, p. 2). Mr. Dempsey cites many aspects of Rockwell's sampling procedures that do not comply with standard practices, as well as Rockwell's own procedures, which are cited in the three subsections below.

A. SOIL ANALYSIS IS INADEQUATE, UNRELIABLE, AND IN CERTAIN AREAS NON-EXISTENT.

Rockwell has failed to properly protect the soil by omitting to conduct necessary soil and water tests and conducting faulty tests. Nuclear regulations require that Rockwell make "every reasonable effort to maintain radiation exposures, and releases of radioactive materials in effluents to unrestricted areas, as low as is reasonably achievable." 10 CFR 20.1(c). The regulations further provide that Rockwell "make surveys necessary to comply with the license that are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present." 10 CFR 20.202(b) Rockwell's soil analysis procedures fail to comply with the above specified regulations.

Dempsey severely criticizes Rockwell's procedures for soil analysis: "SSFL lab personnel analyze soil for gross alpha and beta radioactivity. This is not a good method for assessing environmental radioactivity." (Dempsey Memo, p. 3). Dempsey has three criticisms of the procedures by which gross alpha and beta radioactivity are measured. His first criticism is that Rockwell does not utilize common practice to obtain a uniform particle size of soil. Rockwell uses a Coors crucible through which only 90

percent of the soil will pass instead of the a grinding machine, which is common practice. His second criticism is that Rockwell's environmental report says that they use a copper planchet for counting while current SSFL procedure calls for a stainless steel planchet to be used (Rockwell Document Number N001DWP000008). Dempsy states that this "makes a difference in counting and calibration." His third criticism is that Rockwell heats the soil to 500 degrees celsius without any documentation or references on the validity of their procedure. (Dempsey Memo, p. 3). Standard procedure recommends use of a 450 degrees celsius temperature to avoid the problem of loss of volaatilization of cesium, strontium and other radionuclides. (ORAU Report, p. 8). Dempsey's fourth criticism is that the DOE quality assurance rounds do not include soil analysis and there are no internal quality controls for soil samples.

An EPA radiochemist who has had over thirty years experience in preparing and counting samples for radioactivity verified Dempsey's criticisms. Dempsey concluded his overview of Rockwell's soil sampling procedures with a startling statement: "In short, gross alpha and beta data on soil, even though it has indicated some radiation areas on [the] site, is not a true representation of conditions present in the environment. This procedure is a screening method at best and is not an accurate quantitative procedure." (Dempsey Memo, p. 3).

The ORAU Report also criticizes Rockwell for its use of gross alpha and beta guidelines. The ORAU points out that not only does the use of this procedure violate the 1986 DOE directive to report environmental data in terms of specific radionuclies, use of this method does not allow comparisons of contamination levels with established guidelines, nor is it a reliable and accurate quantitative technique for radiological analysis of soil. (ORAU Report, pp. 6-7).

Moreover, the ORAU Report identifies other areas where standard operating procedures have not been implemented. "Guidelines for such radionuclides as Cesium-137, Strontium-90, Plutonium-239, Nickel-63 and Cobalt-60 which are potential contaminants at SSFL have not been established. (ORAU Report, p. 6). "Procedures for detection of Uranium-238 could be greatly underestimated due to unreliable measurements and assumptions." (ORAU Report, pp. 8-9).

The DOE report also identifies several alarming deficiencies in Rockwell's monitoring and measuring procedures. First "current operations at the facility are different than the past, but soil radioactivity is still monitored at the same locations." In other words, Rockwell is monitoring soil at sites that have already been decommissioned, but not at sites where nuclear activity is currently being conducted. And second, "field sampling locations are not identified by markers....The lack of a repetitive sample location could invalidate the evaluation of annual changes in soil radioactivity at a specific location." (DOE Report, p. 3-34).

Inadequate monitoring and measuring procedures pose a danger to the public because of the inevitable accidents and hazards that accompany use of radioactive and toxic materials. The DOE has found ten areas where hazardous and/or radioactive substances have or may have been disposed of, spilled or released to the environment. "These areas constitute actual and potential sources of soil and/or groundwater contamination. None of the areas have been adequately characterized." (DOE Report, p. 4-48).

The need for adequate soil sampling procedures is demonstrated by the dangerous radioactive and toxic materials that have so far been detected. For example, there is some concern that beryllium may still be found in the soil at SSFL and, when picked up by the wind, could pose a threat to human

health. (Exhibit 4: Karen Johnson, Summary Review of Preliminary Assessments/Site Inspections of Rockwell International Santa Susana Field Laboratory, Ecology and Environment, Inc., July 19, 1989, p. 19). Beryllium has been found to cause Berylliosis, an incurable lung disease caused by an allergic reaction to beryllium. (Exhibit 17: The Denver Post, January 14, 1990).

NRC regulations provide that "no licensee shall . . . use . . . licensed material in such a manner as to permit any individual in a restricted area to inhale a quanity of radioactive material in any period...." 10 CFR 20.103(a).

Cesium-137 was found and attributed to spills around Building 64 which was used as a Special Nuclear Materials Storage area. Higher than background gamma readings were shown when sampled. (Exhibit 5: Gregg Dempsey, Report on Environmental Samples Collected at the Rocketdyne Santa Susana Field Laboratory, November 8, 1989, p. 6, hereinafter referred to as the "Dempsey Report"). About six areas around this building were found to have 5 to 10 times the ambient background rate and the levels appear to increase with depth. These levels may be in excess of the DOE guidelines. "Hot spots were noted in a portion of [this] excavation." (ORAU Report, p. 12).

Tritium was discovered in the soil at Building 59 by EPA officials although SSFL personnel were unaware of its presence. (Dempsey Report, p. 6). This was a result of improper or lack of monitoring. Gregg Demsey of the EPA found that SSFL has not collected soil or water samples to analyze for tritium. (Dempsey Memo, p. 6).

Levels in the soil around the catch pond of the Old Leach Field for the Radioactive Materials Disposal Facility (RMDF) ranged from 10 to 15 times above background on portions of the drainage trough. No thorough survey has

been conducted as yet. North of the RMDF Cs-137 and Sr-90 was released to the facility's leach field due to an accident and a surface spill from a waste treatment operation.

Radiological conditions of old leach fields at SSFL are unknown. "There are other facilities and land areas where radioactive materials were previously used, but which were not included in the 1987 and 1988 [Rocketdyne] survey project. (ORAU Report, p. 14).

Upon surveys, reviews and discussions with staff at the Radiation and Nuclear Services of SSFL, Mr. Berger of ORAU states that "[m]any of the deficiencies which were identified are related to activities or lack of activities which could adversely affect or make questionable the quality level of data." (ORAU Report, p.15). ORAU does, however, state that if Rockwell follows the recommendations on pages 16-17 of its report SSFL will be capable of conducting an accurate assessment of the site. (ORAU Report, p. 15). Until this is done, there is no way of concluding that SSFL poses no threat to the public.

Dempsey concludes that "SSFL sampling, placement of sample locations, and analysis cannot guarantee that past actions have not caused offsite impacts. If the environmental program stays uncorrected, SSFL cannot guarantee that unforeseen or undetected problems onsite will not impact the offsite environment in the future." (Dempsey Memo, p. 8).

How then can Rockwell in its Environmental Monitoring and Facility Effluent Annual Reports of 1987 and 1988 state that "the results of this environmental monitoring indicate that there are no significant sources of unnatural radioactive material in the vicinity of the Rocketdyne sites."? (1987 report at p. 11; 1988 report at p. 11).

The history of monitoring by Rockwell is so suspect and flawed that

reasonable assurance cannot be provided that they will conduct adequate monitoring in the future. Therefore, they have not met their burden for issuance of the requested license and it should be denied. To do otherwise would impose an unreasonable risk to public health and safety, thereby violating the requirements of 10 CFR 70.22(a)(8), which states that each application for a license shall contain "proposed procedures to protect health and minimize danger to life or property."

B. CONTAMINANTS HAVE BEEN FOUND IN THE GROUND WATER

Rockwell's procedures to detect contamination of ground water are completely inadequate. Reports cited below confirm that there is no way Rockwell can assure that they have met the NRC regulations regarding water contamination, 10 CFR 70.20 Appendix B. Rocketdyne states in it's 1986, 1987 and 1988 Annual Review of Radiological Controls reports that there are "[n]o radionuclides present at the nuclear facilities. . ." (1986 report at p. 49; 1987 report at p. 49; 1988 report at p. 62) in water sources sampled. It appears quite suspect that each year's report is worded exactly the same. It would appear to the casual observer that these reports were copied word for word from year to year. New findings by the DOE and EPA, as well as other surveys have proven Rockwell's statements to be inaccurate and complete falsehoods.

> [N]ew tests show toxic chemical contamination of groundwater is moving from Rockwell International's Santa Susana Field Laboratory toward Simi Valley. . .The new data came from 19 wells drilled on the nuclear section of Area IV last fall. . . 'There were two surprises' said Jim Ross, senior engineer for the California Regional Water Quality Control Board. 'The (toxic chemicals) was higher than we thought, with the potential to flow off the site greater than we thought.'"(Exhibit 6: Daily News, December 15, 1989).

The NRC regulations require that Rockwell provide accurate reports on measuring levels of radiation. Part 70.20.201(b) requires that "[e]ach

licensee make or cause to make such surveys as . . . are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present." Rockwell has not complied with this part of the regulation. Rockwell reports that there are no radioactively contaminated liquids nor can specific radionuclides in samples be routinely identified due to extremely low radioactivity levels. (Rocketdyne, Annual Review of Radiological Controls, 1986 at p. 20; 1987 at p. 18; 1988 at p. 30). When Rockwell states that the environmental monitoring program provides a measure of the effectiveness of the Rocketdyne safety procedures, we should bear in mind, that the new findings indicate that measure must be very small indeed. It is hard to imagine after a twenty five year period and 870 tons of wastes having been deposited in impoundments on site, (Johnson, p. 14) that Rockwell has not detected some type of releases to the environment.

Ground water monitoring has been inadequate to estimate the amount contamination to the environment. Thus it is highly inaccurate of Rockwell to assume that a significant release has not occurred on site. For instance, in the early 1960's, radioactiviely-contaminated water containing strontium-90 and yttrium-90 was released to the soil beneath a leachfield for the RMDF. The soil in the area was excavated and asphalt was used to seal the joints and fractures in the bedrock. However, "there is still a high probabililty that contaminants reached the groundwater in this area. This likelihood has not been investigated further." (Johnson, p. 16). The DOE states that,

> "Due to an insufficient number of groundwater monitoring wells, the groundwater monitoring program is not capable of: accurately determining the nature and extent of groundwater contamination at known and potential source areas and detecting off-site groundwater contamination." (DOE Report, p. ES-2).

The EPA concurs with this assessment, agreeing that monitoring is flawed.

The EPA criticizes Rockwell's ground water sampling procedure for the same reasons it criticizes its soil sampling procedure: due to deficiencies caused by alpha and beta self-absorption. In addition the manufacturer of the counter mechanism stated that, "specifications will only guarantee 45-47% with a massless point source, something a water sample can never be." (Dempsey Memo, p. 3).

Another area where radioactive contamination of ground water has been detected is at Building 059 which was formerly the location of the Space Nuclear Auxiliary Power (SNAP) prototype reactor. The building contained sand and equipment contaminated with Cobalt-60. Ground water seeped into the building and became radioactively contaminated. "There has been insufficient monitoring around the area to determine the extent of ground water contamination and whether any radioactive contamination has migrated from the building site." (Johnson, p. 13).

Tritium has been found in a level far above what could be called a background amount and according to EPA further study is needed to determine the origin and spread of tritium on the SSFL site.

DOE reports that a potential release of contaminated water run-off from the Building 886, Sodium Disposal Facility, exists due to inadequate control of stormwater run-on and run-off. Soils in the burn pit area are contaminated principally with Cesium-137. These soils can be breached from runoff upslope and allowed to flow out of the area. Also undetected releases of contaminants could occur to the north of Area IV offsite due to the lack of periodic sampling in that area.

> The fact that the release was occurring undetected until Proposition 65 required SSFL to consider run-off sampling raises questions about the adequacy of the monitoring program. (DOE Report, p. 3-58). The ground water monitoring program is inadequate at known or suspected sources of contamination. (DOE Report, p. 3-69).

Rockwell simply refuses to believe that they do make considerable releases to the environment.

> Health officials contend that the nitrogen tetroxide residue...is a hazardous waste and must be either packaged and sent to a waste-disposal facility, or treated in the company's on-site waste water treatment system. Company officials contend the waste water is only slightly tainted with nitrogen tetroxide, does not qualify as a hazardous waste and can be released down Bell Creek..."(Exhibit 7: Daily News, February 6, 1990).

Impoundments on the site for radioactive waste have been found to be unlined; others were lined, but not maintained adequately, and were found to have cracks and there was no leachate system for the impoundments. Many areas lack proper containment facilities to prevent releases of contaminants to the environment. There are at least 17 known areas where waste materials were stored or treated. (Johnson, p.4). Part 20.301 of the NRC regulations have strict standards for disposing of and storing waste. These regulations are not met due to the lack of adequate containment facilities.

Dempsey summed up his appraisal of the SSFL by stating:

> However, the SSFL sampling. . .cannot guarantee that past actions have not caused offsite impacts . . .It is also clear to me that Rocketdyne does not have a good 'handle' on where radiation has been inadvertently or intentionally dumped onsite. Most of the evidence on site spills is incompletely documented or anecdotal. (Dempsey Memo, p. 8).

Rockwell's monitoring and measuring of ground water contamination is confirmed to be inadequate. These inadequacies warrant a denial of their application for renewal of their license.

C. THERMOLUMINESCENT DOSIMETRY (TLD) MONITORING IS INADEQUATE TO ASSURE RADIOACTIVE MATERIALS ARE NOT IN THE AIR

Rockwell cannot accurately determine how much radiation in within and around their facility. Rockwell is required to adequately measure radiation pursuant to 10 CFR 20.103(a)(1). Part 20.103(a)(1) provides: that no

licensee shall possess, use, or transfer licensed material in such a manner as to permit any individual in a restricted area to inhale a quantity of radioactive material. . . Part 20.201(b) requires that the licensee, Rockwell, make surveys that are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present. Rockwell's surveys regarding radiation in the air do not accurately evaluate radiation in the air.

Dempsey responded to Rockwell's environment report on TLD monitoring for the facility and offsite areas by stating:

> questionable practices are alluded to in the environmental report. The first is that data obtained by dosimeters is normalized to 1000-foot altitude, by using an adjustment factor equal to 15 mR/1000 ft. elevation difference to obtain site averages. I talked to two nationally recognized dosimeter experts and neither had heard of this practice. This 15 mR/1000 ft. is undocumented by reference in the environmental reports. Both experts I spoke to felt that this normalization is meaningless. Also, in both the calendar year 1987 and the unpublished calendar year 1988 SSFL environmental reports, comparisons for the dosimeters placed by the State of California and a DOE intercomparison project were 'not available' for inclusion at the time the report was published. Bill Watson of the California Department of Health Services, Environmental Management Branch, assured me that data was available and provided to SSFL. Even if data was unavailable for inclusion in a previous year's report, it should have be[en] added as an addendum for the following year's report. The unpublished 1988 report does not contain information about 1987 omissions. This leads me to think that the SSFL dosimetry program might not compare favorable with the other groups. Systematic error that might be present in dosimetry analyses might make SSFL dosimetry data look comparable to itself but still may make these analyses invalid or suspect. (Dempsey Memo, pp. 4-5).

> The lack of a meteorological tower onsite was also mentioned as a concern. SSFL uses the EPA code AIRDOS to define dose to affected offsite areas. However, the tower information used is from the Burbank Airport. Better AIRDOS information could be generated with a closer-to-site or onsite met tower. (Dempsey Memo, pp. 7-8).

These statements indicate the need to reassess Rockwell's dosimetry data on and off-site to show that an error has not been made. We therefore request that Rockwell's application for renewal of their license be denied.

IV

ROCKETDYNE HAS NOT ESTABLISHED THAT IT WOULD NOT POSE AN INORDINATE DANGER TO THE ENVIRONMENT DURING A NATURAL DISASTER

NRC regulations require the licensee to provide a plan for protection against natural phenomena. 10 CFR 70.22(f). NRC regulations also require Rockwell to supply the Commission with complete and accurate information. 10 CFR 70.9. Rockwell has failed to meet these regulations, as I will outline below.

A. EARTHQUAKES

Rocketdyne has not established that it would not pose an inordinate danger to the environment should a major earthquake happen near it. Rocketdyne asserts in its On-Site Radiological plan that:

> All facilities are constructed according to the Uniform Building Code as applied to Industrial buildings. This provides satisfactory protection against fire, earthquake and structural collapse. (Rocketdyne, On-Site Radiological Contingency Plan, RI/RD 88-206, July 25, 1989, at 2.1.3.4).

The SSFL has been operating at least in part since the 1950's. The Uniform Building Code to which the Hot Lab was built long ago has since been substantially strengthened. The Hot Lab could not meet today's Uniform Building Code, let alone current seismic standards for nuclear facilities.

The San Fernando earthquake of 1971, with a magnitude of 6.6 on the Richter Scale, was approximately 15 miles from SSFL. That earthquake did severe damage to the Van Norman Dam, some 10-12 miles from SSFL, which required the evacuation of virtually all of the north San Fernando Valley, as it was feared that tens of thousands of deaths would have occurred if the dam burst. (U.S. G.S. Geological Survey Circular 701, at p. 8). The Juvenile Hall landslide which also occurred during this earthquake involved

an area almost a mile long. It resulted from liquefaction of a shallow sand layer. (U.S.G.S. Geological Survey Circular 690, 1974, at p. 8). This is the same cause of the Oakland Freeway collapse of October 17, 1989 in San Francisco.

> Secondary effects of earthquakes include a variety of short range events, such as liquefaction, landslides, fires...and long range effects, including phenomena such as regional subsidence or emergence of land masses and regional changes in groundwater levels. Liquefaction is transformation of water saturated granular material from a solid state to a liquid state as a result of an increase in the pore-water pressure caused by intense shaking. . .Damage and even catastrophic destruction have resulted from fires indirectly caused by earthquakes. Destruction of electrical power lines and broken gas lines can start fires that are difficult to control...because water mains may be broken. (Kellar, N. Edward, Environmental Survey, 4th Edition, 1985, Marril Publishing Company).

> Following the destructive San Fernando earthquake in Southern California LBL (Lawrence Berkeley Laboratory facilities) which is located in the San Francisco Bay area. . .began a comprehensive review of its own existing facilities and operations to improve seismic safety. The earthquake safety review revealed that significant structural deficiencies, stemming from many sources, were present in over 50 percent of the buildings reviewed. (U.S.G.S. Geological Survey Circular 919, 1983)

Seismic hazard analyses were completed for major DOE site throughout the United States in a study by TERA Corporation under contract to LLNL. The results of the detailed seismic hazard analysis of major DOE sites are presented in an eight-volume set of reports. (U.S.G.S., supra 919).

The foregoing reflects the extensive upgrading at other nuclear facilities following the 1971 San Fernando earthquake. What evidence is submitted by Rocketdyne of any upgrading whatsoever following an earthquake where severe damage was within 10-15 miles of SSFL? The only reference regarding adequacy of facilities at SSFL is the one quoted at the beginning of this section. Since we know the Hot Laboratory was in existence before the 1971 San Fernando earthquake by some years, what was done to bring it up to seismically safe standards as LBL and LLNL and within recommendations of

the TERA Corporation? The TERA Corporation report for DOE and LLNL, noted above, recommended various upgrading at DOE facilities. Moreover, since Rocketdyne is the proxy for DOE in great part as both its contractor in the Hot Laboratory and as operator in the balance of the SSFL facility, it is incumbent on DOE to make available for review the TERA recommendations and to determine whether they were all put into place, or at the very least, what if anything was done to upgrade SSFL following the devastating San Fernando earthquake.

What the foregoing information reflects is that the area of SSFL is close to the major San Fernando earthquake of 1971, that it would be susceptible to the same kind of ground liquefaction that buildings and the Van Norman Dam area suffered, that fires could be the worst part of any big disaster because of the widespread toxic chemicals both buried and in tanks and in containers. The toxicological pollution airborne due to fire alone would be enormous given the amounts of chemicals in and above ground. But even more troublesome is the rapid spread of embedded contaminants underground dislodged from years of settling into soils, now found to be present in wells monitored by EPA and DOE that could dramatically accelerate in their flows and be carried into any "changes in groundwater levels", that could accompany a significant earthquake. The map of earthquake faults (Exhibit 8: Earthquake fault map, 1971) shows that SSFL is ringed by three fault areas within several miles and by 42 faults just to the north, south and east alone in a radius of about 75 miles.

And what of the fire risks connected with a major earthquake? It is well known that fires caused by broken gas lines, electrical wire displacements, and contributed to by the failure of broken water mains to combat it, are one of the main effects of a major earthquake.

The New York Times (Exhibit 10: New York Times, October 22, 1989) discusses the effects radioactive wastes that may have been dosed with cyanide, as practiced years ago, may have. It further discusses wastes that generate hydrogen, an explosive gas, which are supposed to be vented regularly. Referring to Savannah, Georgia, it states that this part of the country is vulnerable to earthquakes which could rupture the storage tanks releasing their contents. It also refers to the suspected chemical explosions at Kyshtym in the Ural Mountains. This brings to mind EPA's Gregg Dempsey's comments "[m]ost of the evidence on site spills is incompletely documented or anecdotal." (Dempsey Memo, p. 8).

We now know that SSFL is a vast repository of radioactive substances, volatile organic chemicals, rocket engine fuels and open sodium burn pits where a multitude of chemicals lie in wait. The effect an earthquake-induced fire would have on the environment is too fearsome to contemplate!

The San Francisco earthquake of October 17, 1989 demolished areas of San Francisco and many cities as far away as 70 miles from the epicenter. The following are excerpts from the newspapers that relate to what might be anticipated here should the "big one" strike within a similar perimeter of SSFL.

The Daily News, October 18, 1989, page 1, reported

> The quake along the San Andreas fault. . . 7.0 on the Richter Scale centered 10 miles N/E of Santa Cruz. Dozens of buildings in the vast area were set on fire or leveled by the powerful shaking. . .the tremblor collapsed portions of highways and bridges throughout Santa Cruz and San Jose. There have been mudslides and accidents on all major freeways.

The Daily News, October 18, 1989, page 17, reported

> ...'up to 100,000 people living in 3000 buildings in Los Angeles would be in jeopardy if the city were hit with the same intensity as the one which struck San Francisco' said city councilman, Hal Bernson.

The Los Angeles Times, October 18, 1989, page A.7, reported

> Soil sliding caused structural damage to homes and caused gas mains to break leading to fires.

The Los Angeles Times at page A.4, reported, regarding fires in the Marina District

> Although the exact cause of the fire was not immediately known, the smell of natural gas wafted throughout the neighborhood.

The Los Angeles Times at page 2 reported

> In all, 40 buildings collapsed in Santa Cruz and Watsonville where damage was estimated at $350 million. All highways in Santa Cruz closed, Highway 17, the main line to San Jose, was blocked by landslides and fissures. A wild fire had consumed 650 acres and 25 buildings had burned to the ground.

While one might argue that SSFL was undamaged during the 1971 earthquake, it cannot be assumed that it would be so lucky again.

The Daily News, October 19, 1989, at page 11, reported

> Unfortunately, despite the tragedy this week in the San Francisco area, California has yet to experience in modern times the BIG ONE, a disaster geologists say is more likely to strike Southern California first . . .'the party line is generally that there is a 60% chance of a very large, e.g., a magnitude of 8 or greater, on the southern San Andreas over the next 30 years' said Douglas Given a geophysicist, with the U.S. Geological Survey.

It is important to note that the SSFL site is a sandstone bedrock. "The surface mantle consists of unconsolidated gravel, sand, silt and clay." (Rocketdyne, Environmental Monitoring and Facility Annual Report RI/RD 88-144, 1987, at p. 2). Parts of this sand could be suspect to liquefaction, given a major enough earthquake.

These two earthquakes should by now have elicited some response by Rockwell that its SSFL site has matched, at the very least, the DOE

recommended safeguards following the 1971 quake, and hopefully, updated by the lessons learned following the 1989 quake. The burden of proof of earthquake safety has not, in my opinion, been met.

B. Fires

Apart from earthquake-related fire, the SSFL area is an annual undue fire risk because of the area it is located, which is an extreme fire hazard area, the high winds and dry brush in the area, and the highly volatile chemical compounds stored above and below the surface.

The SSFL area exists in a rugged, mostly inaccessible area, except for one extremely curvacious road. It is in the present throes of a 10 year low drought. The Chamise type vegetation has live fuel moisture slightly above the critical percentage for fire hazards, all of which makes this area a high risk in view of the combination of high winds and drought dry vegetation.

The Los Angeles area rainfall has had an average rain over the last 112 years of 14.89 inches per year. For the last three years there has been a serious drought in which the rainfall has average 8.40 inches. The year 1989 had the fourth lowest rainfall since 1878. (Exhibit 12: Los Angeles Rainfall 1877-1989).

The Woolsey Canyon area, which is immediately adjacent to SSFL, has a Chamise type vegetation. It has a current live fuel moisture level of 63%

This is well below the 10 year average from 1981-90. It is slightly above the 60% critical level. (Exhibit 13: Los Angeles County Fire Department, Live Fuel Moisture Summary, 1981-1990). According to Michael A. Theule, fire inspector for the Los Angeles City Fire Department, Santa Ana winds occur regularly and frequently in this region from October to January, and have the effect of potentially and quickly drying the live fuel moisture

below critical levels, thus creating a serious fire hazard.

In Rocketdyne's On-Site Radiological Contingency Plan it shows a comprehensive range of accidents that were evaluated. The report indicates as follows:

> The facts are that a criticality accident is impossible and that there is no credible energetic scenario associated with the TRUMP-S process that could effectively disperse the Pu [plutonium] within or outside the glove box. In order to assure that the most severe accident was bounded, a fire was postulated...In this accident 1 kg of plutonium was postulated to be consumed in a fire...Although the exact release conditions cannot [emphasis added] be specified with assurance it is assumed that a fire or other high temperature situation involving the material, would pose the most hazardous situation which could lead to an airborne release of some of the material. (Rocketdyne, supra, On-Site Radiological, at p. 3-7).

Rocketdyne states that it would take all necessary life-saving actions and call in the Emergency Response Team. (Id., at p. 4-3). It further states that transportation of the seriously injured may have to be by company or employee vehicles "provided roads are passable." (Id., at p. 5-15). If an emergency were to occur during off-hours, how would it be possible for the Emergency Response Team to reach the facility if roads were not passable? Moreover, if an emergency were to occur during on-hours, how would transportation of the injured be possible given the scenario of a major earthquake where it is highly likely that roads would be unpassable due to rock and land slides, cracks and fissures. In the case of fire, the treacherous roads would be cumbersome and hazardous to traverse, and cluttered with fire-fighting equipment, roads would become impassable. Living in the same area as Rocketdyne, I know first hand how difficult it is to evacuate the area during a fire. In 1980 a raging fire swept through Bell Canyon. It would have been a difficult task to navigate through the thick black smoke that accompany such fires as a result of the live fuel

within the dry vegetation, and to circumnavigate the fire fighting equipment that cluttered the roads. It is postulated that such an occurrence could happen again isolating the facility from the emergency response teams.

What all this indicates is that fire worries are a constant and real threat in this area. Continuing operations there with the documented mixed contaminants in the soil, toxic chemicals in the Burn Pit and other areas on site, as well as other chemicals stored there, magnify this threat to health and safety. "The deteriorating condition of many of the solvents and chemical storage cabinets could result in the release of hazardous substances to the environment or fire. These cabinets are rusted and without labels." (DOE Report, p. 4-24).

A population of nearly 250,000 within a 5 mile radius should not be subjected to the risk of fire, chemical explosions and release of air-borne contamination due to fire as a result of Rocketdyne's poor and inadequate procedures that have been documented by the DOE and EPA survey reports.

V

ROCKETDYNE HAS NOT ADEQUATELY DOCUMENTED PAST SPILLS, LEAKS AND INCIDENTS

Rocketdyne has failed to comply with rules and regulations by the ineptitude of the applicant to document past spills, leaks and other related incidents. NRC regulations require Rockwell to supply the Commission with complete and accurate information regarding information for public health and safety. 10 CFR 70.9. Rocketdyne failed to provide identification of existing or potential hazardous materials spilled in and around the facility, as well as, failing to complete state mandated inventory reports of toxic chemicals and radioactive materials as attested by the 16 violations against SSFL brought by California state health officials which have been sent to the state Attorney General's Office for enforcement

action. (Exhibit 7: Daily News, February 6, 1990).

Rocketdyne has stated repeatedly in their documents supporting their license that no significant releases are made to the environment, but new violations against the facility involve illegal disposal and dilution of rocket fuel, findings by the EPA, DOE and other survey agencies involve tritium, cobalt-60, cesium-137, strontium-90, yttrium-90 to name a few. DOE found 10 areas where hazardous and/or radioactive substances have or may have been disposed of, spilled, or released. "These areas constitute actual and potential sources of soil and/or ground water contamination." (DOE Report, p. 4-48). According to this report one area, B/886 Former Sodium Burn Pit, was used for disposal of chemical and radioactive wastes.

> Flammable chemicals were poured into open pits and burned.. ..Unauthorized radioactively-contaminated equipment was buried in trenches and scattered on the surface...No information was available on the amount or type of waste removed, when it was removed, to which location it was removed to, or on what basis the removal was initiated or ceased. (DOE Report, p. 4-48).

The Old Conservation Yard is also a source of soil and ground water contamination. "Leaks and spills may have occurred in an area with no containment and no protection. . .a significant amount of debris and equipment located randomly around the site, with several drums prominent..." (DOE Report, p. 4-58). The S/E Drum Storage Yard's "[h]istoric storage of drums...may have resulted in releases of hazardous substances from leaking, spilled, or rusted through drums exposed to the elements. . .No information was available on this drum storage area." (DOE Report, p. 4-61).

These are a few among several areas that were identified by the DOE as having hazardous substances either poured or dumped into them with no documentation as to when they were dumped there, what the contents were, and when they were removed, if at all. This is an indication of Rocketdyne's

poor documentation procedures. Rocketdyne's existing procedures have failed to provide adequate monitoring of past spills and leaks, and failed to provide identification of existing or potential hazardous materials involved in these spills. Incomplete documentation of past spills have led to the aforementioned violations by the state of California.

In addition, Rocketdyne has failed to keep records reporting the disposal of all special nuclear material; in particular a Sr-90 source assigned to the Hot Laboratory. Although this was a reported incident in their document (Rocketdyne, supra, Annual Review, 1986, at p. 30), it still remains that it is a missing source; therefore, how can there be a report as to its disposal?

VI

SUMMARY

Rocketdyne has failed to comply with the Federal Code of Regulations by use of inadequate equipment and facilities that fail to protect health and minimize danger to life or property. Rocketdyne's procedures to protect health and minimize danger to life or property have been in the past and are currently inadequate. The applicant has failed to provide identification of existing or potential hazardous materials in and around the facility, as well as failed to complete state-mandated inventory reports of toxic chemicals and radioactive materials. Rockwell has failed to show records reporting the disposal of all special nuclear materials satisfactorily.

I echo the concerns made by California State Assemblyman, Richard Katz when he stated "I believe that . . . Rockwell has been and continues to play radioactive Russian roulette with the health and safety of the people in the San Fernando Valley." (Exhibits 14-16: Daily News, October 21,

1989, The Los Angeles Times, October 21, 1989, and Daily News, October 22, 1989, respectively),

Environmental and health concerns should take precedence over production quotas and experimental research projects, such as the TRUMP-S. Rockwell has not taken such concerns into account for many years. Their concerns have centered on the risk of unfavorable public and political perceptions if knowledge of the known contamination at the SSFL were to be public. When the risks to human health and the environment are placed in an inferior position to public or political perceptions, health and the environment generally suffer. It is becoming increasingly alarming to the public that health and safety was not the industry's first priority. Science and progress is all well and good in itself, but when health, safety and the environment suffer because of poor practices and procedures we have not made progress at all. It is, therefore, incumbent upon the nuclear industry, Rockwell included, to put forth its best effort in cleaning up its already dirty environment and place the health and safety of the public, as well as, its workers before all else.

In view of the foregoing, it is clear that Rocketdyne has failed to meet NRC regulations. 10 CFR 70.31(d) states:

> No license will be issued by the Commission to any person within the United States if the Commission finds that the issuance of such license would be inimical to the common defense and security or would constitute an unreasonable risk to the health and safety of the public.

10 CFR 70.23(a) sets out the requirements for approval of an application by stating

> (2) The applicant is qualified by reason of training and experience to use the material for the purpose requested in accordance with the regulations in this chapter;
> (3) The applicant's proposed equipment and facilities are adequate to protect health and minimize danger to life or

property;
(4) The applicant's proposed procedures to protect health and to minimize danger to life or property are adequate;

The foregoing pleading has demonstrated that Rockwell has not met its burden to demonstrate compliance with 10 CFR 70.31(d) and 70.23(a), among others. The standards for the Commission to grant of renewed license have not been met, and the license, therefore, must not be renewed.

Wherefore, for all the foregoing reasons set forth above, the undersigned Intervenor respectfully requests, as relief sought in the above matter, that Rockwell International Rocketdyne undertake the recommendations set forth by the ORAU Report (pp. 16-17) and, as they have repeatedly stated in the Daily News and The Los Angeles Times newspapers, decontaminate, decommission and dismantle the Hot Laboratory now. I respectfully request that Rockwell International's Rocketdyne license application for renewal for Special Nuclear Material number SNM-21 be denied.

Intervenor acknowledges the assistance of George J. Rembaum in the preparation of this brief.

I affirm that the foregoing is true and correct to the best of my knowledge and belief.

Dated this day, the 19th of February 1990 at Bell Canyon, California.

Jon Scott

DOCKETED
USNRC

'90 FEB 20 P4:42

OFFICE OF THE SECRETARY
DOCKETING & SERVICE
BRANCH

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of

ROCKWELL INTERNATIONAL CORPORATION

(Rocketdyne Division, Special Nuclear Materials License SNM-21)

Docket No.(s) 70-25-ML

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing Direct case of intervenor, Jon Scott have been served upon the following persons by U.S. mail, first class except as otherwise noted and in accordance with the requirements of 10 CFR Sec 2.712

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Docket No.(s) 70-25-ML

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Dated at Bell Canyon, CA this
19 day of February 1990

Jon Scott

+ By Federal Express

++ By Hand

EXHIBITS

1. Dempsey, Gregg, Memorandum to Daniel M. Shane, July 28, 1989

2. Berger, J.D., Review of Surplus Facilities Radiological Monitoring Santa Susana Field Laboratories December 12, 1989, Oak Ridge Associated Universities (ORAU)

3. Pearman, Donald W., Summary of Environmental Restoration and Waste Management Plan Provisions Relevant to the Santa Susanna Field Laboratory, Department of Energy, San Francisco Operations Office, September 15, 1989

4. Johnson, Karen, Summary Review of Preliminary Assessments/Site Inspections of Rockwell International Santa Susana Field Laboratory, ecology and environment,inc., July 19, 1989

5. Denver Post, "Flats lung disease discovered" January 14, 19890

6. Dempsey, Gregg, Report on Environmental Samples Collected at the Rocketdyne Santa Susana Field Laboratory, Nov. 8, 1989

7. Daily News, "Rockwell contamination spreading toward Simi" 15, Dec. 1989 (San Fernando Valley, CA)

8. Daily News, "New Rockwell violations found" 6, Feb. 1990 (San Fernando Valley, CA)

9. Earthquake Fault Map,

10. New York Times, "Cost of Cleaning Up Plant Waste In Nuclear Recycling Is Escalating" 29, Oct. 1989

11. New York Times, "At bomb plants, new fears of explosions" 22, Oct. 1989

12. The Los Angeles Times, "Nuclear Lab Reports Leak of Plutonium" 19, Oct. 1989

13. Los Angeles Rainfall 1877-1989 chart

14. Los Angeles County Fire Department, Live Fuel Moisture Summary 12, Jan.1990
Live Moisture 1981-90 averages charts

15. The Los Angeles Times, "Katz Calls on State Officials to Oppose Rockwell's License" 17, Oct. 1989

16. Daily News, "Rockwell to shut nuke lab" 21, Oct. 1989 (San Fernando Valley, CA)

17. The Los Angeles Times, "Rockwell to Close Nuclear Hot Lab" 21, Oct. 1989

18. Daily News, "Rockwell plans to cease all Simi Hills nuclear work" 22, Oct. 1989 (San Fernando Valley, CA)

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2. California Safe Drinking Water and Toxic Enforcement Act of 1986

3. Daily News, "Rockwell contamination spreading toward Simi" 15, December 1989

   "New Rockwell violations found" 6, February 1990

   "Rockwell to shut nuke lab" 21, October 1989

   "Rockwell plans to cease all Simi Hills nuclear work" 22, October 1989

   (Daily News, San Fernando Valley, California)

4. Denver Post, The, "Flats lung disease discovered" 14, January 1990

5. Dempsey, Gregg, Memorandum to Daniel M. Shane Site Visit to Santa Susana Field Laboratory Operated by Rockwell Rocketdyne, Environmental Protection Agency (EPA) July 1989

6. Dempsey, Gregg, Report On Environmental Samples Collected At The Rocketdyne Santa Susana Field Laboratory, Environmental Protection Agency (EPA), Office of Radiation Programs, Las Vegas, Nevada, November 8, 1989

7. Department of Energy, Environmental Survey Preliminary Report DOE Activities at Santa Susana Field Laboratories Ventura County, California February, 1989

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10. U.S.G.S., Geological Survey Circular 919, 1983

11. Johnson, Karen, Summary Review of Preliminary Assessments/Site Inspections of Rockwell International Santa Susana Field Labortory, ecology and evnironment, inc., July 19, 1989

12. Kellar, N. Edward, Environmental Geology, 4th Ed., 1985, Marril Publishing Company

13. Los Angeles County Fire Department, Live Fuel Moisture Summary 1981-90

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"Rockwell to Close Nuclear 'Hot Lab'" 21, October 1989

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"At bomb plants, new fears of explosions." 22, October 1989

16. Pearman, Donald W., Summary of Environmental Restoration and Waste Management Plan Provisions Relevant To The Santa Susana Field Laboratory Department of Energy, San Francisco Operations Office, September 15, 1989

17. Rocketdyne, Annual Review of Radiological Controls, 1986, 1987, 1988

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JUL 28 1989

MEMORANDUM

SUBJECT: Site Visit to Santa Susana Field Laboratory Operated by Rockwell/Rocketdyne

FROM: Richard D. Hoppen for Gregg D. Dempsey, Chief
Field Studies Branch, ORP

TO: Daniel M. Shane, On-Scene Coordinator, Emergency Response Unit

On July 5, 1989, I reviewed documentation that your office had assembled on the Rockwell/Rocketdyne Santa Susana Field Laboratory (SSFL) located near Canoga Park, California. The purpose of my consultation to your office was to help assess the relative magnitude of health hazards, health risks, past, present, and future environmental problems and how Superfund, through your office, might address those concerns.

In the two and a half days I spent in your office reviewing that documentation, I studied previous Rocketdyne Environmental Reports, contractor reports on wells and DOE site reviews. As I communicated to you during my exit interview, it was my opinion that I could not come to a conclusion about conditions relating to the site without a visit which would include; discussions with Rocketdyne's laboratory personnel, my personally making measurements on the various sites identified, and possibly collecting environmental samples for radiation analysis. You arranged for your technical assistance team (T.A.T.) contractor, Ecology and Environment, Inc., to prepare a site safety plan and outline of measurements and sampling protocol with my input according to your internal procedures. Arrangements were made at that time and in the following days for a site visit. I also made assurances to the Ecology and Environment Corporate Health Physicist, Jackie Gillings, that I would provide dosimetry and exit personnel surveys for T.A.T. personnel working at my direction on the SSFL site.

Mr. Moore told me that approximately 10% of the soil will not pass through the crucible, mainly due to the fact that the sand, clay or pebble size is too large. It is common practice that if one wishes to obtain a uniform particle size, soil is ground in a machine designed for this purpose. Two grams of soil are used in a planchet for counting. Because of absorption of the alpha and beta radioactivity within the soil, the procedure has highly variable results. The procedure attempts to make a correction for this but it is not adequate. The environmental report states that samples are to be counted in a stainless steel planchet, but the current SSFL procedure (Rockwell Document Number N001DWP000008, dated July 9, 1984) states that a copper planchet is called for. This also makes a difference in counting and calibration. I asked Mr. Tuttle and Mr. Moore for the basis of the 500 degrees and was shown an EPA procedure that is used to prepare a sample for an analysis for americium-241 by alpha spectroscopy, an entirely different procedure. I asked for documentation or references on the validity of the procedure used by SSFL. I was told by Mr. Moore that this procedure was worked out a long time ago and he did not know where that documentation might be or if it existed. He also stated that while the SSFL does participate in DOE/EML quality assurance rounds, this procedure for soil is not included. Spike samples have apparently never been prepared and run through this procedure to provide internal quality control. I discussed this procedure with Dr. Paul Hahn, an EPA radiochemist who has over 30 years experience in preparing and counting samples for radioactivity, and he verified my conclusions. In short, gross alpha and beta data on soil, even though it has indicated some radiation areas on this site, is not a true representation of conditions present in the environment. This procedure is a screening method at best and is not an accurate quantitative procedure.

Water samples are also collected on the SSFL site. The procedure is to evaporate the water to dryness and count for gross alpha and beta radioactivity. I inspected typical samples and found that alpha and beta self-absorption is, again, likely to be a problem. I asked Mr. Moore for a typical beta counting efficiency for this procedure. Simply, this is a measure of the ability of the counter to detect radiation. Mr. Moore told me that this is typically 2 dpm/cpm (two disintegrations per minute per count per minute) or 50%, I called the manufacturer of this counter and was told that their specifications will only guarantee 45-47% with a massless point source, something a water sample can never be. For similar reasons as stated above, I doubt the validity of these analyses as well.

Vegetation samples were collected until 1986. This was stopped only two years after an internal SSFL review determined that problems existed with alpha and beta counting and changes should be made. I reviewed the procedure for vegetation counting. It is similar to the soil counting in that the vegetation is essentially ashed before counting and only one gram of ash is analyzed. The procedure states: "Gently wash the vegetation in the

for inclusion at the time the report was published. Bill Watson of the California Department of Health Services, Environmental Management Branch, assured me that data was available and provided to SSFL. Even if data was unavailable for inclusion in a previous year's report, it should have be added as an addendum for the following year's report. The unpublished 1988 report does not contain information about 1987 omissions. This leads me to think that the SSFL dosimetry program might not compare favorably with the other groups. Systematic error that might be present in dosimetry analyses might make SSFL dosimetry data look comparable to itself but still may make these analyses invalid or suspect. A more thorough review needs to be conducted.

Also on July 12, you, your T.A.T. contractor, a representative of the State of California, Department of Health Services, Charles Myers, and myself met with SSFL staff to determine the course of action regarding visiting contaminated or formerly contaminated locations at SSFL. We reviewed several locations and as a parting question you asked if there were any other locations that SSFL personnel could tell us about that were not in the environmental reports. The location which was shared with us we later learned was near the Special Nuclear Materials Storage Area and had involved a liquid spill in the early 1960's. It was agreed that we would look at that location along with the others.

On July 13, I prepared the T.A.T. contractor and myself to go onto these locations. In accordance with arrangements I made with the Ecology and Environment Corporate Health Physicist, I placed "pocket" or "pencil" type gamma dosimeters on all T.A.T. personnel. I extended that level of protection to both you and myself as well. No dosimeter accrued a measurable exposure during the course of the day although dosimeters worn by Mr. Suter and Mr. Chambers of the T.A.T. did drift off zero in the first two hours after charging. This potential exposure is negligible. I also prepared a Ludlum Model 19 Micro-R Gamma Scintillation Counter, an Eberline E-520 Geiger-Mueller Counter with both HP-260 and HP-270 Gamma Probes and a Ludlum Model 14C Geiger-Mueller Counter with a "pancake" type gamma probe, all recently calibrated. The Ludlum 14C was used to verify that contamination had not been removed from each location. Each person from EPA and the contractor were surveyed with this instrument following exit from each site and none were found to be contaminated. We were escorted through the SSFL site by Randy Ueshiro, at times by Mr. Tuttle, and Gary Lavagnino of the Department of Energy, ESQA Division.

The first site visited was described as the "Old Sodium Burn Pit," an area where radiologically contaminated materials had been dumped at some time in the past. There were "Caution-Radioactive Materials" signs around the perimeter of this pit. At one time, a protective dike or berm around this area had washed away and material from this pit was allowed to move off this site in an uncontrolled fashion. The dikes had been rebuilt and a concrete gutter had been constructed on the upslope side of the pit to

specific gamma emitting isotopes and one for tritium.

The "Old Conservation Yard" was surveyed next. This is an area which had recently been cleaned up by SSFL personnel because of "high beta readings." The area was unremarkable at 13 - 15 μR/hr. No samples were collected from this location for radioanalysis.

We then went to the "New Sodium Burn Pit Area." It was also described as having "previously high beta readings" but again was unremarkable at 18 - 20 μR/hr. No samples were collected for radioanalysis.

The last site we visited was the site we had been told about only the day before in the meeting with SSFL officials. It was described as "Building 064, the Special Nuclear Materials Storage Area." An area around this site was in the process of being cleaned up. I spoke to a technician, Mr. Wallace, who was conducting a survey of this area. He showed me an area of 60 μR/hr. I got a shovel and upon digging at this location in about a foot was able to increase the surface reading to 200 μR/hr. Mr. Wallace stated that about 50 pCi/gm of beta radioactivity had been seen at this site. SSFL personnel were unsure of the nature or time of the spill at this location but were confident it was in the early 1960's. Apparently SSFL environmental surveys had identified this site. One soil sample to be analyzed for specific gamma emitting radionuclides was collected at this site. A duplicate was also collected for quality control of the contractor laboratory.

There are several reasons why I did not collect certain environmental samples. Vegetation both on and off site was of interest to me. The majority of grasses in the area were dry and apparently had been that way for some time. I would have sampled typical forage on which deer might browse, but SSFL personnel were unsure about what these might be. Second, it might be necessary once the gamma results are obtained from the contractor to go back and get samples analyzed for Sr-89/90 or actually collect new samples. As you are aware, a contract laboratory for the radioanalyses was selected without a review of their laboratory performance. The Sr-89/90 analysis is extremely difficult and tedious and it will be necessary to verify lab performance before samples are analyzed so worthless data is not generated.

It is also important to comment on the audit that was conducted by the Department of Energy in February 1989. This document is in preliminary form and was supplied to me by your office to assist in my review. DOE made an attempt to review many aspects of the SSFL Environmental Program in this document. I echo their concerns about the well and air sampling at SSFL and offsite. Both of these items, as well as environmental sampling in general, need to be reviewed for adequacy. DOE also identified some problems in the Radiological Laboratory but did not do an extensive review. The lack of a meteorological tower onsite was also mentioned as a concern. SSFL uses the EPA code AIRDOS to define dose to affected offsite areas. However, the tower information used is from the

REVIEW OF SURPLUS FACILITIES RADIOLOGICAL MONITORING SANTA SUSANA FIELD LABORATORIES VENTURA COUNTY, CALIFORNIA

Prepared by

J. D. Berger

Environmental Survey and Site Assessment Program
Oak Ridge Associated Universities

INTRODUCTION

In May 1988, the Department of Energy (DOE) conducted an internal review of environmental activities in Area IV at the Rockwell/Rocketdyne-operated Santa Susana Field Laboratories (SSFL) Site in Ventura County, California. While this survey did not find evidence of environmental problems, representing an immediate threat to human health, it did identify the presence of facilities and land areas containing residual hazardous and/or radiological substances from previous site operations. These residual materials are considered potential sources of soil and/or groundwater contamination; several areas of groundwater contamination by chlorinated organics were also identified, and an expanded groundwater monitoring program was recommended.

Findings of this survey generated concern by residents of surrounding communities. In response to these concerns the Environmental Protection Agency (EPA) Region IX created a Work Group to ensure coordinated environmental regulatory management of this site and on July 12-13, 1989, a site inspection was conducted by the EPA Region IX Emergency Response Unit. This inspection also identified some deficiencies in the SSFL environmental radiological

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monitoring program, but it concurred with the 1988 DOE survey findings that the site does not represent an imminent health or environmental hazard.

Results of the DOE and EPA surveys, indicating radioactive material contamination of facilities and land areas and identifying deficiencies in the SSFL radiological monitoring program, raised concerns at the DOE San Francisco Operations Office (DOE/SAN) and the DOE Office of Nuclear Energy (DOE/NE), regarding the capabilities of the Rockwell/Rocketdyne program to accurately assess the radiological status of its facilities. The DOE/NE Division of Facility and Site Decommissioning therefore requested that the Environmental Survey and Site Assessment Program of Oak Ridge Associated Universities (ORAU) review the SSFL radiological monitoring program, relative to capabilities for identifying, characterizing, and decommissioning sties associated with past and current DOE activities. Mr. J. D. Berger, Director of the ORAU Environmental Survey and Site Assessment Program (ESSAP), and Dr. C. F. Weaver, Senior Radiochemist with the ESSAP, visited the SSFL Site on September 28-29, 1989. Discussions with SSFL staff members, document reviews, facility tours, and limited independent radiological monitoring of several facilities were conducted at that time. Because of conflicting schedule demands, several key SSFL Radiation and Nuclear Safety staff were unavailable during portions of the site visit; additional documentation was thus requested and was provided to the ORAU reviewers at a later date. The findings and recommendations resulting from the ORAU review are presented in this report.

SITE DESCRIPTION

The Santa Susana Field Laboratories Site is located in southeastern Ventura County, about 47 kilometers (29 miles) northwest of Los Angeles, at the western border of the San Fernando Valley. It is situated on a plateau, near the crest of the Simi hills, about 300 meters (1000 feet) above the Valley floor. Surrounding terrain is rugged; zoning of neighboring property is rural or rural-agricultural. The nearest resident is about 2.1 kilometers (1.3 miles) to the southeast. Population density in 1980 was estimated at

about 8,000,000 persons within 80 km (50 mi) of the site. The climate of the region is subtropical with mean monthly temperatures ranging from 10° C to the mid 20's; the region is semi-arid with a mean rainfall of about 45 cm (17.5 in).

The site comprises a total of approximately 1090 hectares (2700 acres) and is divided into four administrative areas (Areas I-IV) and a Buffer Zone. DOE programs are conducted in Area IV of the SSFL Site. This area consists of about 117 ha (290 acres), owned by Rockwell, of which 36 ha (90 acres) are DOE optioned land.

Since the early 1950s, Rockwell and its predecessor organizations have conducted programs in Area IV of the SSFL for the Atomic Energy Commission, Energy Research and Development Administration, and their successor, the Department of Energy. These programs have included engineering, research and development, testing, and manufacturing operations, primarily related to nuclear reactor systems and components. In 1966 the Energy Technology Engineering Center (ETEC) was established at this Site to provide engineering, development, and testing of components for the Liquid Metal Fast Breeder Reactor Program. Although primarily conducting programs for DOE, the site has also conducted activities for the Nuclear Regulatory Commission, Department of Defense, and other government related or affiliated organizations and agencies.

Numerous facilities and associated land areas have become contaminated -- either as a result of their intentional use with radioactive material or inadvertently -- with low-levels of radioactivity. Potential radioactive contaminants identified at this site include uranium (depleted, natural, and enriched), plutonium, americium-241, fission products (primarily cesium-137, and strontium-90), activation products (cobalt-60, europium-152, nickel-63, promethium-147, and tantalum-182) and tritium. As facilities were removed from service, Rockwell performed decontamination and/or stabilization. In 1985 Rockwell/Rocketdyne initiated a project to survey or resurvey selected sites where knowledge of the radiological status was felt to be inadequate.

FINDINGS

Staffing

The radiological monitoring program responsibilities reside with the Radiation and Nuclear Safety group, managed by Mr. R. J. Tuttle. In addition to the manager there are seven professional level staff positions in the group, of which one is a contact position. The Radiation and Nuclear Safety group is supported by Radiation Instrument Services (three staff positions). Most of the individuals in these organizations have multiple years of experience in radiological monitoring and control related activities at SSFL; several of the key individuals have been at the SSFL for 25-35 years and are thus well acquainted with site activities and the history of radioactive materials usage at the site. At the present time there are two vacancies on the Radiation and Nuclear Safety staff and one vacancy on the Radiation Instrument Services staff; replacement of these vacancies is being pursued. In addition, the head of the laboratory operations has announced intentions to retire in approximately six months; replacement efforts and cross-training in laboratory activities have not yet been initiated. Several staff members appear to have the major portion of the site radiological monitoring responsibilities, without provisions for complete backup in their absences.

Although the current staffing level is considered adequate to perform the necessary radiological monitoring and control services required for routine operations, significant additional demands are being placed on the staff to respond to recent DOE and EPA reviews and concerns of nearby residents, the State of California, federal and state legislative representatives, miscellaneous independent environmental concern organizations, and the media. An increased level of effort to identify and decontaminate all facilities and land areas is being sought. Such demands will likely require additional manpower, beyond that required for day-to-day operations.

Equipment

Portable radiological monitoring and laboratory equipment are state-of-the-art. Portable equipment includes a variety of detectors and display instruments; this equipment is capable of measuring surface activity and exposure rate levels to satisfy the DOE guidelines for decommissioning. This instrumentation appears to be well maintained and calibration was current for the instruments observed during the site visit. Laboratory analytical instrumentation includes a low-background gas proportional counter and a pulse height analyzer with a 15% high-purity germanium gamma detector. The laboratory does not have wet chemistry radio-analytical capabilities. As with the portable instrumentation, the laboratory equipment appeared to be well maintained and calibrated within the established SSFL procedures. (See item 3 for further discussion on calibration.) Although the proportional counter and gamma spectrometer are adequate for most of the radionuclides and sample media anticipated at SSFL, certain specific analyses, e.g. isotopic plutonium, strontium-90, and tritium, must be performed by an outside commercial laboratory. The presence of tritium, promethium-147, and nickel-63 as potential radionuclide contaminants may justify the on-site capabilities for measurement of these low-energy beta emitters in water and on filter papers (smears and air samples); acquisition of a liquid scintillation counter would provide that capability. Implementing wet chemistry capabilities is not considered appropriate with the current staffing levels and anticipated sample load.

Procedures

SSFL has documented procedures for many aspects of the radiological monitoring program; however, detailed standard operating procedures have not been prepared for some activities. For example, collection, preparation, and analysis of samples are described in a document entitled "Radiological Environmental Monitoring Program Sampling Procedures, Analysis Procedures, and

Radioactivity Measurement Methods," but there is not a comparable Rockwell procedure document, describing the methods for performing direct measurements of alpha and beta-gamma surface activity and exposure rates or for performing tests for removable contamination. It should be pointed out that individual facility survey reports do describe instrumentation, measurement techniques, and procedures used. Several of the pertinent radiological procedures reviewed were issued 3 to 5 years ago; they are currently being revised in response to recent audit recommendations.

SSFL has reviewed guidelines for residual radioactivity, relative to land and facility use without radiological controls, presently used by the DOE and NRC, and has adopted the most restrictive of the values when there are differences between the guidelines. The guidelines being used for surface contamination of facilities are those used by both the NRC and DOE's Division of Facility and Site Decommissioning. Exposure rate guidelines at SSFL (5 μR/h above background) were adopted from NRC practices for reactor facility decommissioning; they are more restrictive than those being used by DOE and for non-reactor NRC-licensed facilities. With exception of Ra-226, Ra-228, thorium, and uranium, neither the DOE or NRC have established generic guidelines for residual concentrations of radionuclides in soil. Instead, such guidelines are developed, as needed, on a site specific basis. Therefore, guidelines for such radionuclides as Cs-137, Sr-90, Pu-239, Ni-63, and Co-60, which are potential contaminants at SSFL, have not been established. Rockwell has been using soil contamination guidelines of 46 pCi/g for gross alpha and 100 pCi/g for gross beta (these values include background). The gross alpha value is comparable to levels for most nuclear fuel cycle materials (uranium and plutonium) which have been used by the NRC. However, guideline levels for Cs-137, Sr-90, and Co-60, which have been used for decommissioning at other DOE and NRC sites, are typically equivalent to less than 100 pCi/g of gross beta activity. Both DOE and NRC have developed procedures for establishing site-specific soil guidelines; Mr. Moore of the SSFL staff attended a DOE workshop on developing guidelines, using the RESRAD program, in mid September. The use of gross alpha and gross beta guidelines for soil is not consistent with the September 1986 DOE directive to report environmental data in terms of

specific radionuclides and does not enable comparisons of contamination levels with established guidelines. In addition, while analysis for gross alpha and gross beta is a useful "screening" technique for soil, it is not a reliable and accurate quantitative technique for radiological analysis of soil. While gross alpha and gross beta analyses were used for determining acceptance of decontaminated soil areas in the past, (in some cases with correlation by other analyses), recent changes in procedures now require gamma spectrometry or other radionuclide specific evaluations. Gross alpha and gross beta analyses continue to serve as screening techniques, particularly in the environmental monitoring program.

Field survey techniques (sampling and measurement) are consistent with those in use by industry, government contractors, and regulatory organizations, involved in facility decommissioning activities. Instrumentation and procedures are capable of measuring surface activity levels with adequate sensitivity to assure that current federal guidelines are being satisfied. SSFL also performs statistical analysis of all survey data to demonstrate, on the basis of cumulative probabilities, that there is greater than a 90% confidence level that guidelines are met. ORAU has had occasion to perform confirmatory evaluations of several Rockwell facilities, which were being decommissioned for release from NRC license restrictions. These included fuel fabrication areas at the DeSoto site (in Canoga Park) and the T055 (mixed oxide) and T093 (L-85 reactor) facilities at SSFL. In each case, it was the finding of the confirmatory survey that Rockwell's decommissioning activities were effective and that data were adequate and accurately described the radiological status of the facility. Several areas where the field survey program could be improved are:

a. Survey measurements and sampling locations should be referenceable to the state and/or USGS grid system to enable future location, i.e. following facility demolition and possible rebuilding.

b. Micro-R meters are used to scan soil areas to locate "hot-spots" of gamma-emitting radionuclides for removal. Exposure rate measurements at 1 m above the surface are used for the acceptance survey, following

decontamination. Based on findings of limited EPA and ORAU monitoring at Building T064 (see page 11) the scanning procedure does not appear to be effective in identifying all gamma "hot spots" and the instrumentation and/or technique should be reevaluated.

c. A comprehensive listing of detection capabilities (sensitivities) for the various field survey equipment and survey techniques should be developed.

With some exceptions, laboratory procedure are also consistent with those used by other organizations performing decommissioning activities. One of the areas of concern is the past reliance on gross alpha and gross beta analyses of soil, rather than conducting specific radionuclide analyses (see earlier discussion - page 7). Another concern, raised by the July 1989 EPA report, was the possible loss by volatilization of cesium and strontium (and possibly other radionuclides) from soil samples, during a drying/ashing cycle at 500° C. Procedures at EPA and DOE analytical labs typically recommend temperatures of 450° C to 480° C, without identifying concern for volatilization of cesium or strontium. Although the ORAU laboratory staff does not believe that volatilization of these two elements should be a potential problem at 500° C, they recommend reducing the temperature to 450° C, to be consistent with other standard procedures. The effect of such temperatures on other potential contaminants should also be evaluated and laboratory procedures adjusted accordingly. In the gamma spectrometry procedures, photopeaks which are potentially encumbered, are being used for determination of certain radionuclides. For example, the 186.2 keV peak is being used for Ra-226 and the 183.7 keV peak for U-235. Difficulties in resolving these close peaks and possible shifts in peak location could result in misidentifying contaminants and/or miscalculating concentrations. Use of alternate photopeaks, such as the Bi-214 (Ra-226 daughter) 609 keV peak (equilibrium status must be considered) and the U-235 143 keV peak, would provide more reliable measurements in cases where both contaminants might be present. To estimate the level of U-238 in soil, the Ra-226 level is being measured, and an equilibrium state is assumed. This approach will greatly underestimate the U-238 level in the case where the

contaminant is processed uranium, such as is the case at SSFL. If gamma spectrometry is to be performed for measuring U-238, either the 1.001 MeV Pa-234m photopeak (very low abundance) or the Th-234 photopeaks at 63 keV or 93 keV (doublet) could be used. Gamma spectrometer calibration does not use a simulated soil matrix. Although the effects are negligible at medium and high photopeak energies, there can be a significant change in calibration at energies below 100 keV. The magnitude of the change will be dependent upon the energy, soil density, content of heavy elements in soil, and counting geometry selected.

The QA (quality assurance) program, relative to radiological monitoring for facility decommissioning, is described in the Rockwell procedures document, "Radiological Environmental Monitoring Program Quality Assurance." While this program is very adequate in many areas, some aspects of the program do not appear to have been implemented and some standard QA requirements have either not been incorporated into the program or should be more specific. Equipment calibration is in accordance with the established SSFL procedures and appropriate for the nuclides of concern; calibration source certificates and calibration records were reviewed and no deficiencies noted. The laboratory and field conduct an adequate QC (quality control) program of regular background and source checks of equipment response; documentation of results is good. Calculation procedures are also well documented with an adequate paper trail of calculational program validation and records of changes to such programs. A chain-of-custody procedure for samples has not been implemented. Although the SSFL procedure requires documentation of personnel qualifications for the various program activities, records supporting training and certification in specific laboratory and field survey procedures could not be provided. Periodic internal audits of limited aspects of the program have been performed by the Radiation and Nuclear Services group management; the frequency of such audits is not specified. The program has not been included in QA audits performed by other Rockwell organizations, DOE, or outside organizations.

The laboratory performs analyses of spike, blank, duplicate, replicate, and split samples, but the minimum frequency or percentage of such control

analyses is not specified. The laboratory also participates in the DOE/EML interlaboratory comparison program for selected radionuclides in air, water, vegetation and soil samples; results have been acceptable, based on a review of 9/88 and 4/89 test results. Although samples for tritium and some other specific nuclide analyses are performed by a commercial laboratory, Rockwell does not include quality control samples (spikes, blanks, and duplicates) to evaluate the performance of such vendors.

Independent Monitoring of Selected Sites

Limited gamma monitoring with a sensitive sodium iodide scintillation detector and countrate meter was performed at five facilities, for the purpose of independently assessing the adequacy of decontamination efforts and/or confirming radiological data and information presented in Rockwell survey documents. Findings are described below:

Conservation Yard

Contaminated surface soil had been recently (August 1989) removed from about a 100 m^2 area in the Conservation Yard (also known as the Old Salvage Yard). The contaminant was identified as Cs-137; levels were slightly above 100 pCi/g (gross beta). The follow-up survey report had not yet been completed. Thorough near-surface gamma scans were performed over the remediated area, and random scans were conducted at other locations in the Conservation Yard. There was no evidence of residual surface contamination by gamma emitting radionuclides (the instrumentation used for this survey is capable of identifying small areas of surface Cs-137 contamination at concentrations of less than 10-15 pCi/g).

Old T028 Building Site

Building T028 was originally a small test reactor facility and portions of the building were later used for uranium metal alloy operations. The upper

story of this facility has been removed; a survey in November 1988 concluded that the remaining portions of the facility meet the guidelines for release without radiological restrictions. Limited surface scans were performed in the remaining portions of the building, on the pad (floor of the demolished upper section), and around the surrounding grounds. Ambient background levels in portions of this facility are 3 to 4 times higher than the typical SSFL area background; due to stored radioactive materials at the nearby RMDF facility. This condition decreased the ability to identify very low levels of residual contamination in small areas by the gamma scan; however, as with the Conservation Yard area, no evidence of localized elevated readings, which would suggest significant residual contamination, were detected.

Building T064

Portions of the paved grounds and soils area near the entrance to the T064 (Source and Special Nuclear Material Vault) Building became contaminated in the early 1960s and partial cleanup was performed at that time; more recently (August and September 1989) further remediation was performed. The contaminent was identified as mixed fission products from a leaking (but empty) shipping cask. Cleanup involved excavation of soil to remove an estimated 100 m^2 of contaminated area. Cleanup was based on meeting a 5 $\mu R/h$ (above background) exposure rate at 1 m above the surface and satisfying the gross alpha and gross beta soil levels of 46 pCi/g and 100 pCi/g, respectively. Gamma spectrometry was also performed on soil samples. The report on follow-up monitoring was not yet complete at the time of the review, and SSFL conclusions as to the effectiveness of decontamination were therefore not available. Gamma scanning of the remediated area identified several (about 6) small areas with contact radiation levels 5 to 10 times the ambient background rate. The levels appear to increase with depth. These findings suggest that there is residual subsurface contamination at the site, which may be in excess of the DOE guidelines. Because there is no generic DOE guideline for Cs-137 in soil, SSFL will be evaluating the residual contamination, using the RESRAD program.

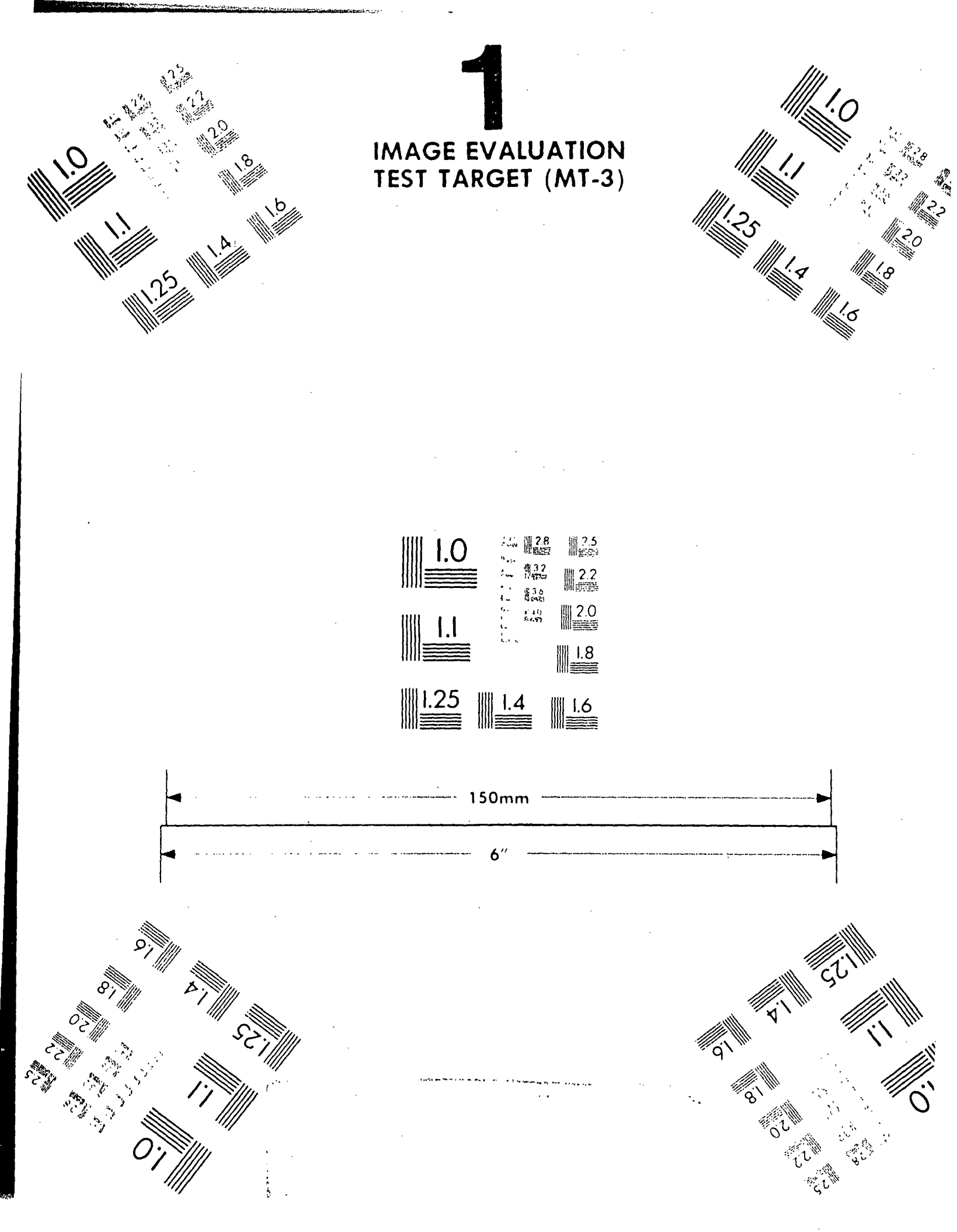
General above-background gamma levels and several "hot spots" were noted in a portion of the excavation, containing a clay pipe (similar to tile sewer piping). Radiation and Nuclear Services personnel could not identify the purpose of the pipe or its outfall location. Because of the presence of residual contamination in the vicinity of the exposed section of pipe, there is a question as to whether the pipe had contained radioactively contaminated liquids and whether there was an old leach field in the vicinity of the T064 Building, which might be contaminated.

Sodium Burn Pit

A December 1987 systematic survey of the Old Sodium Disposal Facility (Sodium Burn Pit) revealed areas of surface contamination containing Cs-137, Sr-90, and uranium. This contamination is limited to small isolated areas of the two former evaporation ponds. The survey did not address subsurface conditions; however, the potential for subsurface contamination exists because cleaned items were previously buried near the pit and the integrity of the sodium reacting pool (pit) is unknown. Gamma surface scans of the pad, the two former ponds, and some of the adjacent area, including several surface runoff pathways, identified only several small areas of elevated direct radiation in the ponds. These areas were the same ones identified by the July EPA survey.

Catch Pond and Old Leach Field Area for the Radioactive Material Disposal Facility

Southwest of the Radioactive Material Disposal Facility (RMDF) is catch basin for surface runoff from the facility grounds. The basin and the drainage trough leading to this basin are concrete and have been coated with an asphalt sealer. Contaminants are primarily Cs-137 and Sr-90. Ambient radiation levels in portions of this area were slightly elevated, due to the proximity to the RMDF where radioactive material is processed and stored. Gamma scans did not identify any evidence of surface contamination around the edges of the catch basin, but levels ranging from 10 to 15 times above background were noted on portions of the drainage trough. A thorough survey of this area has not yet been conducted.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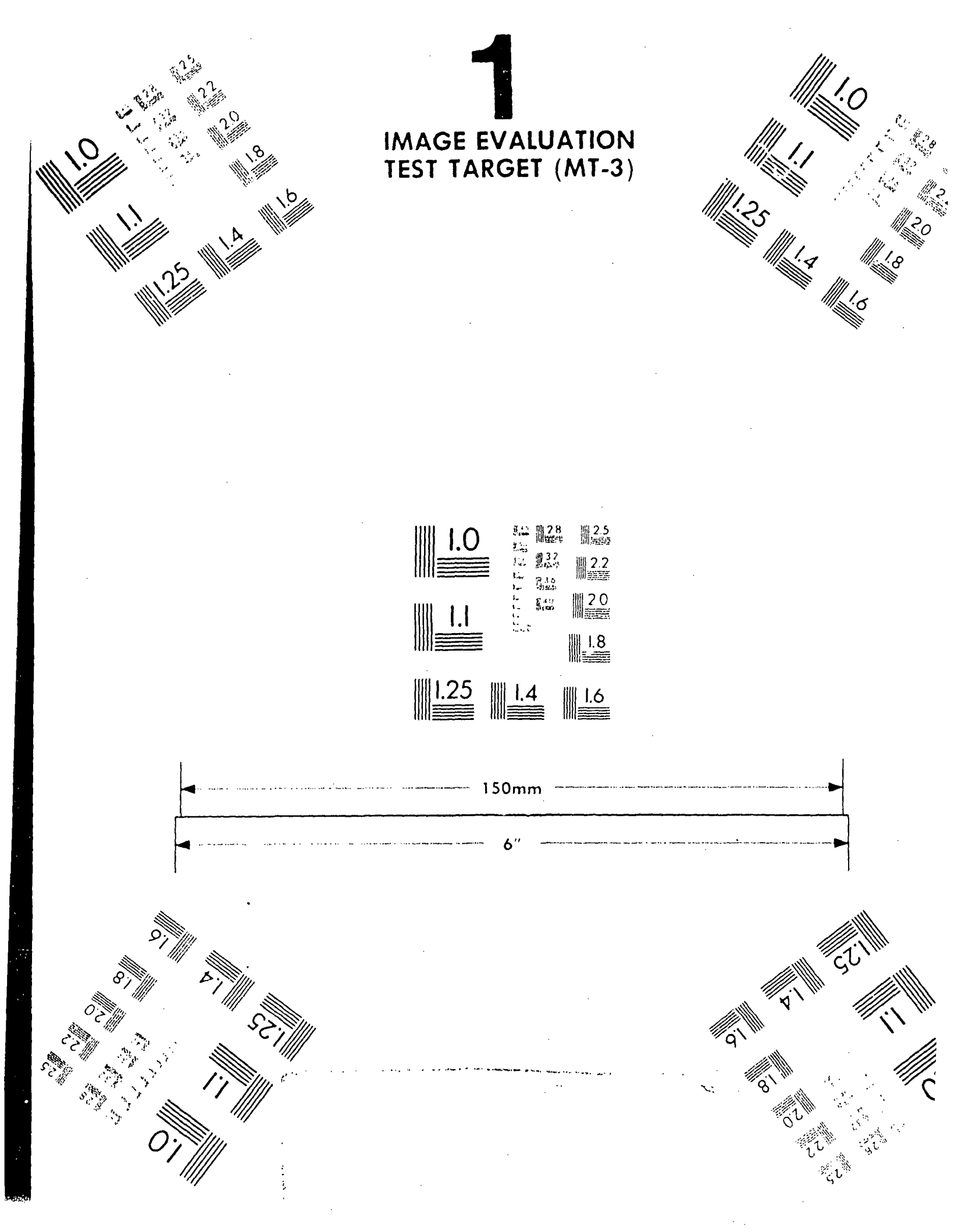
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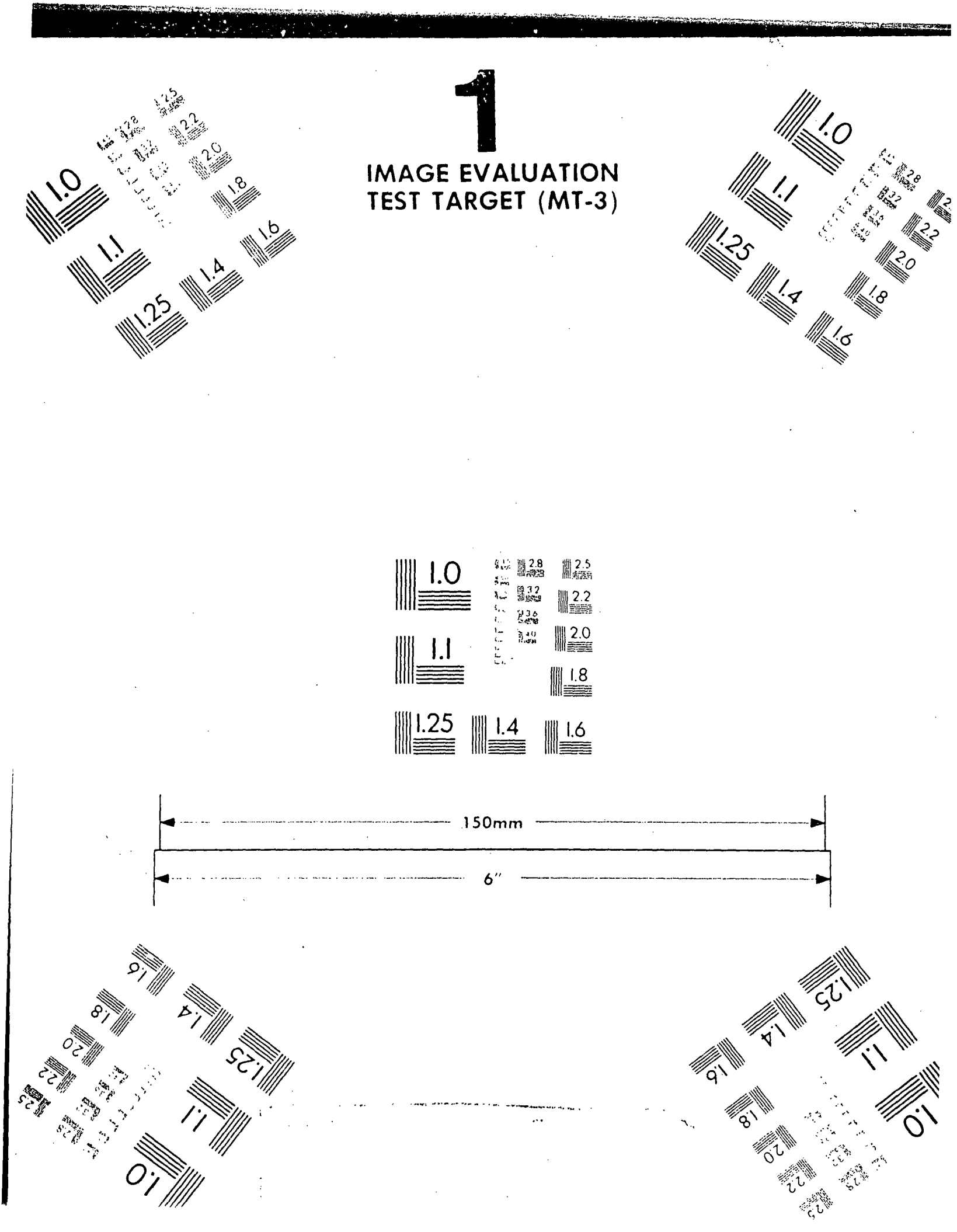
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strengthened. The following section contains a list of recommendations arising from the findings of this review. Many of the deficiencies which were identified are related to activities or lack of activities which could adversely affect or make questionable the quality level of data. It is ORAU's opinion that with relatively minor changes and additions to the present radiological monitoring program, SSFL will be capable of conducting thorough and accurate assessments of the radiological status of the site. Portions of the site have been recently evaluated, but additional data and information are needed to provide a comprehensive evaluation of some of those areas. Current radiological data have not been developed for other portions of the site, some of which may contain residual contamination. An accelerated schedule or expanded scope of site surveys would likely require a level of effort, beyond the currently available resources.

RECOMMENDATIONS

1. Evaluate staffing requirements relative to the current and anticipated workload. Actively pursue staff replacements and additions, as determined appropriate. Initiate plans for replacement of laboratory head. Cross-train staff in key activities to provide backup capabilities.

2. Evaluate potential low-energy beta analytical needs to determine whether acquisition of a liquid scintillation counter would be cost effective.

3. Develop additional detailed procedures, covering aspects of the radiological monitoring program such as monitoring surveys and measurement of surface activity and exposure rates. Finalize revisions of procedures, as appropriate, and establish a regular schedule for procedure review and update.

4. Develop guidelines for residual concentrations of radionuclides in soils at SSFL. It is suggested that the DOE RESRAD program be used for this purpose.

5. Use gross alpha and gross beta soil analysis only for screening purposes; develop radionuclide-specific analyses for evaluating soil contamination levels.

6. Implement referencing of surveys to state and/or USGS grid systems.

7. Review surface gamma scanning procedures for improved identification of "hot-spots" and small areas of contamination.

8. Develop a list of equipment detection capabilities.

9. Modify drying/ashing procedure for soil to reduce the peak temperature to 450° C. Also, evaluate possible effects of temperature on loss of other potential contaminants.

10. Evaluate use of alternate photopeaks for gamma spectrometry of certain radionuclides.

11. Obtain a simulated soil matrix standard for gamma spectrometer calibration.

12. Develop a chain-of-custody procedure for samples.

13. Initiate an auditable program of training and qualification of personnel in radiological monitoring procedures.

14. Develop and implement a program to assure periodic comprehensive audits of radiological monitoring activities, related to decommissioning. This program should include internal audits and audits by Rockwell, DOE, and external agencies.

15. Initiate a program to including quality control samples for evaluating performance of commercial analytical laboratories.

16. Implement a program to syatematically characterize the radiological status of the entire SSFL Area IV site. This characterization should include evaluations of surface activity levels on structures and in surface and subsurface soils. The findings should be compared to applicable guidelines, including site-specific guidelines for soil, as established by the DOE's Surplus Facilities Management Program.

17. Conduct additional investigations of questionable conditions, identified at the remediated are of the T064 facility.

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13. "Radiological Survey of the Source and Special Nuclear Material Storage Vault T064," GEN-ZR-0005, August 19, 1988.

14. "Executive Summary of the DOE SSFL Site Radiological Survey," GEN-ZR-0015, October 10, 1988.

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The U.S. Department of Energy, under the leadership of Secretary James D. Watkins, has set as a major goal the restoration of public creditability for the Department to safely operate its unique defense, research and test facilities. The finalization of the Department's Environmental Restoration and Waste Management Plan is a cornerstone of that effort.

This paper is intended to give all interested persons insight into the features of this plan that are relevant to the DOE facilities operating within Area IV of the Santa Susanna Field Laboratory (SSFL). The SSFL is located in Southern Ventura County near the crest of the Simi Hills at the western border of the San Fernando Valley, California. The Rocketdyne Division of Rockwell International Corporation has conducted research activities for the Department on portions of this site since the late 1950's. Rockwell also conducts business for NASA and other federal and commercial sponsors in the Areas I - III of the SSFL.

Due to the significant local concern regarding the chemical and radioactive contamination at the SSFL, it is important for the public to understand how the Department intends to continue to assess and cleanup the contamination at the site. The Department is sincere in its desire to inform the public regarding its plans. It is our hope that this paper provides a clearer picture of those plans.

One final note: While this paper defines a number of activities intended to clean up the Department's facilities at SSFL and restore them to a condition safe for reuse, it is important to understand that the SSFL does not present an imminent health or environmental hazard to workers at SSFL or the communities surrounding the site, as confirmed by the EPA findings after its extensive inspection and survey at the site.

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Donald W. Pearman
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EXHIBIT 3

Summary of Environmental Restoration and Waste Management Plan Provisions Relevant to the Santa Susanna Field Laboratory

Background

In May 1988, the Department of Energy conducted an internal environmental survey of its activities in Area IV at the Santa Susana Field Laboratories (SSFL) Site. In May 1989, a report of the survey was released to the public. The survey made known the presence of chemical and radioactive contamination in Area IV at the SSFL. It also reported at least three areas at the site where groundwater is chemically contaminated and stated that an insufficient number of groundwater monitoring wells existed to determine the extent of the contamination. However, the survey found no environmental problems at SSFL that represent an immediate threat to human health.

The communities surrounding the SSFL expressed a substantial concern with the knowledge that the SSFL was contaminated. This prompted numerous inquiries to Rockwell International (the contract operator for the entire SSFL), the Department of Energy and State and local regulatory agencies regarding the environmental conditions at the site. A substantial amount of information was subsequently provided to community groups and the media. In response to a request from Congressman Gallegly, the environmental conditions at the site were independently reviewed by EPA Region IX. In addition to its review, the EPA also prepared a report on the ongoing and planned environmental activities at the site, and recommendations for future actions.

The EPA's report was issued on July 31, 1989 and confirmed earlier findings by DOE and Rockwell International that "this site (SSFL) does not represent an imminent health or environmental hazard." The report recommended review and appropriate modification to Rockwell's environmental monitoring program, additional status reporting, the development of a community outreach plan, additional environmental auditing and further meetings of the SSFL working group which the EPA created to include representatives from all the regulatory agencies involved with the site.

DOE's Environmental Restoration and Waste Management Five-Year Plan

The Department of Energy has developed a plan for cleanup and management of waste materials generated from the Department's operations. The Environmental Restoration and Waste Management Five-Year Plan outlines an aggressive effort to identify and plan

for environmental compliance and cleanup activities at all of the Department's sites.

The purpose of the Five-Year Plan is to establish an agenda for compliance and cleanup against which progress will be measured. The Plan commits the Department to a 30-year goal for environmental restoration, and to an open and participatory process for developing a national priority system for expenditure of funds. This system will be based on scientific principles and risk reduction in terms that are understandable to the public. The Plan will be revised annually, with a five-year planning horizon.

Over the next several months, the San Francisco Operations Office will be completing implementation plans which will specifically address how the provisions of the Five-Year Plan will be carried out at each of its sites, including the Santa Susana Field Laboratory. The plans are scheduled to be completed by January 1990.

The Plan prioritizes the activities proposed for each of DOE's sites. The definition of these priorities are:

PRIORITY 1

Includes activities necessary to prevent near-term adverse impacts on workers, the public, or the environment. Included as a subset are ongoing activities that, if terminated, could result in significant program or resource impacts.

PRIORITY 2

Includes activities necessary for compliance with existing agreements between DOE and Federal, state, and local agencies, that were not captured by Priority 1.

PRIORITY 3

Includes those additional activities that would further reduce risks, promote full compliance, be cost effective, and prevent disruption of ongoing DOE missions, that were not captured by Priority 1 and 2.

PRIORITY 4

Includes activities that go beyond external regulations but are included in DOE orders or in industry-accepted standards not required by regulations, that were not captured by Priority 1, 2, and 3.

Provisions of the Plan Relevant to SSFL

While the Plan is termed a "Five-Year Plan," it includes estimated funding requirements, by priority level, over a seven year period (FY 1989 - FY 1995). For the SSFL, total funding

for environmental compliance and cleanup activities at all of the Department's sites.

The purpose of the Five-Year Plan is to establish an agenda for compliance and cleanup against which progress will be measured. The Plan commits the Department to a 30-year goal for environmental restoration, and to an open and participatory process for developing a national priority system for expenditure of funds. This system will be based on scientific principles and risk reduction in terms that are understandable to the public. The Plan will be revised annually, with a five-year planning horizon.

Over the next several months, the San Francisco Operations Office will be completing implementation plans which will specifically address how the provisions of the Five-Year Plan will be carried out at each of its sites, including the Santa Susana Field Laboratory. The plans are scheduled to be completed by January 1990.

The Plan prioritizes the activities proposed for each of DOE's sites. The definition of these priorities are:

PRIORITY 1

Includes activities necessary to prevent near-term adverse impacts on workers, the public, or the environment. Included as a subset are ongoing activities that, if terminated, could result in significant program or resource impacts.

PRIORITY 2

Includes activities necessary for compliance with existing agreements between DOE and federal, state, and local agencies, that were not captured by Priority 1.

PRIORITY 3

Includes those additional activities that would further reduce risks, promote full compliance, be cost effective, and prevent disruption of ongoing DOE missions, that were not captured by Priority 1 and 2.

PRIORITY 4

Includes activities that go beyond external regulations but are included in DOE orders or in industry-accepted standards not required by regulations, that were not captured by Priority 1, 2, and 3.

Provisions of the Plan Relevant to SSFL

While the Plan is termed a "Five-Year Plan," it includes estimated funding requirements, by priority level, over a seven year period (FY 1989 - FY 1995). For the SSFL, total funding

requirements are estimated at $45.5 million. (To put this amount in perspective, the total funding requirement for all DOE sites for the same period is approximately $23 billion). The Plan contains SSFL activities that have been identified as priority one, three and four:

PRIORITY ONE SSFL ACTIVITIES:

Priority one activities proposed for the SSFL total approximately $19.3 million over the planning period. The Environmental Protection Agency has affirmed that no immediate health or environmental hazards exists at the Site. The ongoing or continuing activities are as follows:

Continue ongoing decontamination and decommissioning of Atomics International Hot Cell (estimated cost @ $10 million for FY89-90) following completion of its DOE missions in fuel decladding.

Continue ongoing decontamination and decommissioning of Bldg 59 (estimated cost @ $7.3 million through FY 1992) to remove all activated steel and concrete structural materials. Contaminated materials will be disposed of at an authorized DOE disposal site and the facility will be released for use without radiological restrictions.

Continue ongoing hazardous waste management activities (estimated cost @ $133K through FY 1992) including disposal of mixed waste.

Continue Building 24 surveillance and maintenance (estimated cost @ $149K through FY 1994) to ensure that it is radiologically safe.

Continue surveillance and maintenance of Radioactive Materials Disposal Facility--RMDF (estimated cost @ $1.6M through FY 1995) to ensure radiological safety.

Continue Building 5 surveillance and maintenance (estimated cost @ $20K through FY 1991) to ensure the radioactive contamination is contained within exhaust ducting, scrubbers and filter plenium.

Provide continued surveillance and maintenance at 6 SSFL work areas (estimated cost @ $55K through FY 1991).Surveillance and maintenance activities are coordinated with ongoing or subsequent decontamination activities.

PRIORITY TWO ACTIVITIES: NONE

PRIORITY THREE ACTIVITIES:

Priority three activities proposed for the SSFL are estimated at $14.8 million over the planning period as follows:

Continue SSFL "Burn Pit" area (Bldg 886) assessment and cleanup (estimated cost @ $7.3 million through FY 1993), assess remedial action alternatives, decontaminate and decommission the area.

Provide waste water disposal system (estimated cost @ $2.9 million through FY 1991) design, procurement and installation for the waste water effluents from ETEC's Sodium Components Test Installation (SCTI).

Install impervious revetments around fuel/chemical tanks (estimated cost @ $864K through FY 1992) and provide secondary containment for chemical storage buildings.

Perform groundwater assessments (estimated cost @ $1.5M through FY 1995) of used waste areas containing drum and storage equipment. Other activities include surveillance, maintenance and installation of monitoring wells.

Dispose of alkali metals (estimated cost @ $1.2M through FY 1991) including hydrides from former SNAP space power and central station.

Dispose of cold traps (estimated cost @ $770K through FY 1992) including the 14 sodium oxide cold traps, and 18/55-gallon drums of liquid metal waste from ETEC operations.

Perform noncompliant facility requirements (estimated cost @ $280K through FY 1993) including obtaining RCRA mixed waste permit for the RMDF, installing storage sheds for radioactive materials, removing underground tanks and cleaning up contaminated grounds.

PRIORITY FOUR ACTIVITIES:

Priority four activities proposed for the SSFL total $11.4 million over the planning period as follows:

Assess, decontaminate and decommission (estimated cost @ $4.8 million through FY 1994) of radioactive contamination in Bldg 024 reactor test vaults, assess remedial action alternatives, and remove activated steel and concrete. Contaminated materials will be disposed of at a DOE disposal site. A survey of the facility will be made to release it for use without radiological restrictions.

Decontaminate and decommission (estimated cost @ $3.2 million through FY 1995) the radioactive and chemical contamination level at the Radioactive Materials Disposal Facility complex, assess remedial alternatives, decontaminate grounds, and
restore land to its natural state.

Design, procure, and construct (estimated cost @ $1.5 million through FY 1991) the SCTI NOX emission control to reduce NOX emission levels.

Decontaminate and decommission (estimated cost @ $1.4 million through FY 1992) the contaminated SSFL work areas identified in radiological survey that includes Bldg 009, grounds at Bldg 064, Bldg 029, the Old Conservation Yards, Bldg 012, and trenches at Bldg 100.

Assess, decontaminate and decommission (estimated cost @ $471K through FY 1991) the radioactive contamination in Bldg 005 exhaust ducting and filter plenums for the release of Bldg 005 to use without radiological restrictions.

ecology and environment, inc.
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International Specialists in the Environment

SUMMARY REVIEW OF
PRELIMINARY ASSESSMENTS/SITE INSPECTIONS OF
ROCKWELL INTERNATIONAL SANTA SUSANA FIELD LABORATORY

SUBMITTED TO:	Carolyn Douglas, EPA T-4-7
PREPARED BY:	Karen Johnson, Ecology and Environment, Inc.
THROUGH:	Patty Cook, Ecology and Environment, Inc.
DATE:	July 19, 1989
SITE:	Rockvell International Santa Susana Field Lab Simi Hills, Ventura County, California
EPA ID#:	CAD093365435, CA1800090010, CA3890090001
TTD#:	F9-8907-015
PROGRAM ACCOUNT#:	FCAZ156SAA
FIT REVIEW/CONCURRENCE:	Chris Richard, 8/7/89

cc: FIT Master File
Tom Mix, EPA T-4-7
Rich Vaille, EPA

1. INTRODUCTION

Previous efforts to assess the hazardous vaste disposal activities at the Rockvell International Santa Susana Field Laboratory (SSFL) have dealt with particular areas within the facility, but have never addressed the entire facility as a whole. Some areas within the SSFL belong to the federal government, while others are owned and operated by Rockvell International, a private corporation.

In order to determine whether the facility as a whole may be eligible for the Superfund National Priorities List, the U.S. Environmental Protection Agency (EPA) requested Ecology and Environment, Inc.'s Field Investigation Team (FIT) to conduct a review of the available documentation pertaining to hazardous vaste activities at the SSFL and evaluate the facility with respect to the Hazard Ranking System set up in the Comprehensive Environmental Resource Conservation, Liability, and Compensation Act (CERCLA) of 1980. EPA's strategy for determination of further action under CERCLA is based solely on a site's potential to

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EA4

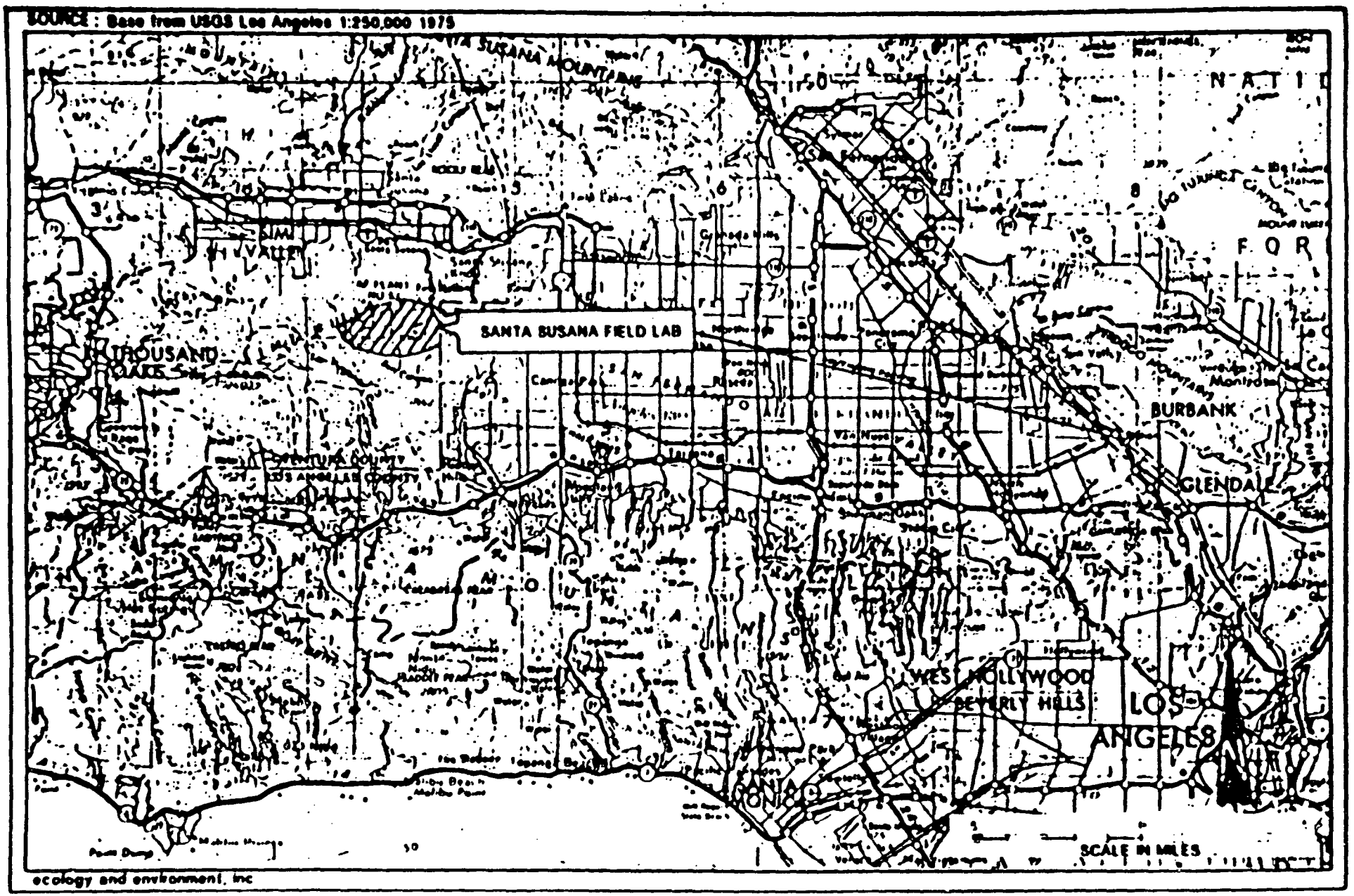

Figure 1 LOCATION OF ROCKWELL INTERNATIONAL SANTA SUSANA FIELD LAB

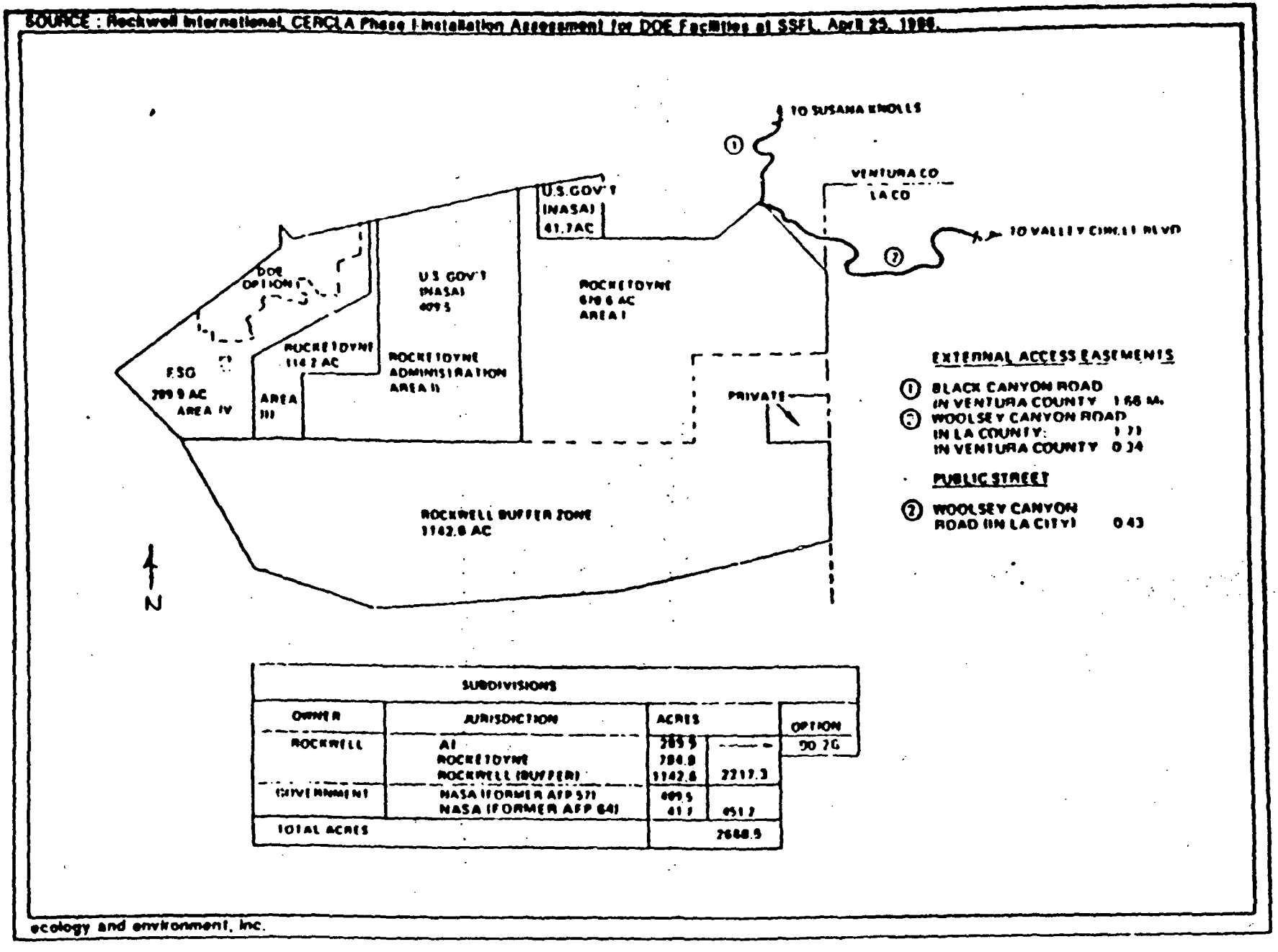

Figure 2 AREAS WITHIN SANTA SUSANA FIELD LAB

TABLE 1

WASTE MANAGEMENT FACILITIES
Santa Susana Field Laboratory
Rockwell International Corporation - Rocketdyne Division
Simi Hills, Ventura County, California

FACILITY	USE	WASTE
AREA I		
APTF Ponds[2] #1 #2	Cooling water catchment and Emergency Spill Containment and Treatment	Kerosene-based fuels (skimmed off) Nitric Acid (D002) (neutralized) Monomethylhydrazine (P068) (treated with hydrogen peroxide, if spilled)
LETF Pond[2]	Waste Treatment and Storage	Corrosive liquids - NaOH, NaF - (Held fo disposal in Class I landfill)
Burn Pit Area[1]	Waste Treatment and Storage	Solid Propellants and Explosives (burned and disposed of in Class I or regular landfill depending on constitnents
Potassium Loop[3]	Inactive Testing Facility	Metallic potassium meal (D003) - avaitin closure
Perimeter Discharge Pond	Water Containment and Storage	Kerosene-base Fuel, Nitric Acid, Monomethyl Hydrazine, Trichloroethene, 1,1,1-Trichloroethane, Freon, Corrosive Liquids
R-1 Reservoir	Water Storage	Kerosene-base Fuel, Nitric Acid, Monomethyl Hydrazine, Trichloroethene, 1,1,1-Trichloroethane, Freon, Corrosive Liquids

1 Active RCRA Facility
2 Undergoing RCRA Closure-Not Used Since November 1985
3 Already Closed Under RCRA

a/kj/rockwell/tbl

FACILITY	USE	WASTE
AREA II (con't)		
Delta Impoundment[2]	Rinsate and Spill Containment	Inhibited Red Fuming Nitric Acid (oxidizer), cryogenic fluorine and hydrogen, kerosene-based fuels, hydrazines, chlorinated and flourinated solvents.
ABSP Pond[2]	Cooling water catchment and Spill Containment	Kerosene-based fuels (skimmed off), chlorinated solvents, hydraulic oil.
Alfa Tank[4]	Storage Tank	Stores spent TCE until removed for reclamation
PCB Storage Area[1]	Drum Storage	PCBs and Hazardous Wastes
Hazardous Waste Storage[1]	Drum storage area	Solvents, alcohol, kerosene, oil, paint thinner, turco descalent, and lab packs
Bravo Skim Pond	Catchment for Bravo Test Area Emergency Spill Containment	Kerosene-base Fuel, Trichloroethene, 1,1,1-Trichloroethane, Freon
Alfa Skim Pond	Catchment for Alfa Test Area Emergency Spill Containment	Kerosene-base Fuel, Trichloroethene, 1,1,1-Trichloroethane, Freon
Alfa Retention Pond	Catchment for Alfa Test Area Emergency Spill Containment	Kerosene-base Fuel, Trichloroethene, 1,1,1-Trichloroethane, Freon
Coca Skim Pond[5]	Catchment for Coca Test Area Emergency Spill Containment	Kerosene-base Fuel, Trichloroethene, 1,1,1-Trichloroethane, Freon

---

1 Active RCRA Facility
2 Undergoing RCRA Closure-Not Used since 1985
4 Generator Only
5 Inactive

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FACILITY	USE	WASTE
AREA IV		
Sodium Burn Pit (B886)	Treatment and Disposal	Metallic sodium, NaK, kerosene, organic solvents, diesel fuel, oil and gease, PCBs, PCTs, terphenyls and biphenyls, cesium-137
SRE Watershed	Runoff from SRE buildings	Asbestos
SNAP Reactor Bldg. (B059)	Groundvater contamination from Bldg. 059	Cobalt-60, chlorinated solvents
Old Landfill	Drum Storage or disposal	Oil and grease, alcohols, sodium and sodium reaction products, phosphoric acid, and asbestos
RMDF Leachfield	Accidental release of contaminated vastevater	Strontium-90 and Yttrium-90
Old Conservation Yard	Drum and equipment storage	Unknovn
ESADA Chemical Storage Yard	Drum Storage	Alcohols and unknovn others
Building 100 Trench	Burning and Disposal	Construction debris and possibly hazardous vastes
S.E. Drum Storage Yard	Drum Storage	Unknovn
Nev Conservation Yard	Drum and equipment storage	Unknovn
Sodium Burn[1] Facility (B133)	Equipment Storage	Metallic sodium - high pH soils

1 Action RCRA Facility

a/kj/rockvell/tbl

samples came primarily from the use of solvents at the rocket engine test stands. Other suspected sources are the pavement washdown areas, laboratory solvent use areas, and impoundments that received spills or discharges (2). The groundwater beneath the facility forms a regional groundwater high, so there are no upgradient sources of contaminants and background levels should be zero.

Although VOC contamination has been documented beneath the facility, existing off-site data does not show that any contamination has migrated off-site. This may be due to the complex nature of the groundwater system (see 3.4 Groundwater) and the sparce off-site monitoring data. There is believed to be a large cone of depression in the groundwater beneath the facility resulting from long-time withdravals of groundwater for industrial uses that may have prevented the off-site migration of groundwater contaminants (4).

There are two areas of suspected radioactive contamination of groundwater in Area IV. The subterranean levels of Building 059 formerly housed the Space Nuclear Auxiliary Power (SNAP) prototype reactor and contain sand and equipment contaminated with cobalt-60. Groundwater has seeped into the building and has become radioactively contaminated. A program of controlled groundwater pumpage has lowered the groundwater level beneath the building and kept a water level depression in the area to prevent the migration of contaminated water away from the building. There has been insufficient monitoring around the area to determine the extent of groundwater contamination and whether any radioactive contamination has migrated from the building area (5).

In the 1970s, there was an accidental spill of radioactively-contaminated water from a tank in the Radioactive Materials Disposal Facility (RMDF) area. While investigating the results of this spill radiation was found in the soil beneath the RMDF leachfield. It is believed that in the early 1960s, water containing strontium-90 and yttrium-90 was accidentally released to the sanitary sewer leachfield for the RMDF. After finding this contamination, the soil in the area was excavated and the joints and fractures in the Chatsworth Formation were sealed with asphalt. However, there is still a high probability that radioactive contaminants have been released to the groundwater beneath this area. This potential observed release has not been fully investigated (5).

There has been no observed release of contaminants to surface water documented from the site. Surface runoff contaminated with metals, VOCs, and asbestos has been detected, but there has not been sufficient monitoring to determine if this contamination has reached any surface water bodies. Therefore, an an observed release to surface water has not been established (See Section 3.5 Surface Water).

3.3 Waste Type and Quantity

Since 1949, the SSFL has been the site of a wide variety of research, development, and testing activities. Chemicals used in these operations include organic solvents, chiefly TCE, hydrazine fuels, oxidizers, kerosene-based fuels, and liquid metals, such as sodium and potassium.

Eighty-nine drums containing such materials as oils, alcohols, sodium and sodium reaction products, grease, phosphoric acid and asbestos were removed in the early 1980s from an unregulated temporary drum storage area referred to as the Old Landfill in Area IV (7). Hydrocarbon and cesium-137 contamination was detected in the soils at the Old Conservation Yard (6). Aerial photographs showed that hundreds of drums were stored there in the 1960s and 1970s with no containment structures. There is a RCRA-regulated PCB storage area in Area II where drums of PCBs and other hazardous wastes are stored. This area is properly enclosed and seems to be in compliance with its RCRA permit.

Although records that document the type or amount of wastes disposed of at the Old Sodium Burn Pit in Area IV are not available, the amount of soil contamination found there during a DOE-CERCLA investigation indicates that the quantity of wastes disposed of was significant. An area of approximately 50,000 square feet was found to be contaminated with VOCs, metals, oil and grease, PCBs, polychlorinated terphenyls (PCTs), terphenyls, and biphenyls. In addition, radioactive cesium-137 was found in soil samples in this area (7).

Area IV has been the site of the Liquid Metal Breeder Reactor Program since 1966. Radioactive wastes from this program consist of both high-activity and low-level wastes. High activity wastes generally contain activation products such as cobalt-60 from fuel contact. Process operations and cleanup activities generate low-level wastes contaminated with uranium, thorium, or plutonium. A small quantity of wastes is generated from research programs (5).

The handling of radioactive wastes, including treatment and storage, takes place at the Radioactive Materials Disposal Facility (RMDF). Waste treatment consists of the solidification and evaporation of low-level wastes. These wastes are then placed in 55-gallon drums for shipment to an off-site radioactive waste disposal facility. In February 1989, 11 drums containing low-level transuranic (TRU) wastes (by-products of uranium decay), were in storage (5).

High-activity materials such as irradiated fuel elements are not treated on-site. They are stored in below-grade vaults designed for the storage of fuel elements or high-activity wastes (5). Existing information does not indicate if these wastes are transported off-site for final disposal, or accumulated in the vaults.

There are two areas of suspected radioactive contamination of groundwater. The subterranean levels of Building 059 that formerly housed the Space Nuclear Auxiliary Power (SNAP) prototype reactor contain sand and equipment contaminated with cobalt-60. Groundwater has seeped into the building and has become contaminated. A program of controlled groundwater pumpage has lowered the groundwater level beneath the building and kept a water level depression there to prevent the migration of contaminated water from the building. There is insufficient monitoring around the area to determine if the program has been successful (5).

pumpage of groundvater from the facility's vater supply vells for industrial usage has reportedly created a large cone of depression that may have trapped the contaminants beneath the site (4). Additional off-site monitoring is needed to confirm this assumption.

There is potential radioactive contamination of the groundvater from two sources in Area IV: the SNAP reactor facility (BLDG 029) and the RMDF leachfield. Additional monitoring in the area of these facilities is needed to determine the presence and extent of radioactive contamination.

The groundvater in the Chatsvorth Formation is not used as a major source of drinking vater. The SSFL is provided vith bottled vater from several licensed suppliers for use as drinking vater. The Metropolitan Vater District of Southern California supplies the local vater purveyors vith drinking vater from imported surface vater. No municipal drinking vater is derived from groundvater. The Southern California Vater Company, a community vater purveyor, has a stand-by vell vithin three miles of the SSFL, but the vell has not been used in at least 10 years (8).

A preliminary assessment for Area II performed in 1988 identified 400 private domestic vells vithin three miles of the facility (9). A vell canvass performed for the facility's RCRA permitting process in 1984 identified 16 vells vithin one mile of the site, 15 of vhich vere inactive (no operable pump installed) (10). The sixteenth vell vas only used for lavn irrigation. A hydrologist for the Ventura County Department of Vater Resources felt that "many" of the 400 domestic vells may be inactive. This is based on the current availability of municipal vater supplies and the relatively high salinity of the groundvater.

The mean total dissolved solids concentration found in samples from the Chatsvorth Formation vells on-site is approximately 670 milligrams per liter (mg/l) (4). The California Recommended Maximum Contaminant Level (MCL) for total dissolved solids is 500 mg/l, indicating that the vater from the Chatsvorth Formation may be more saline than is acceptable for drinking vater usage.

The SSFL has 17 vater supply vells that vere constructed prior to 1960. These vells provide about 58 million gallons of vater per year for sanitary, cooling, and other industrial uses (2). The net seasonal precipitation for the area is about 1.5 inches per year (12).

3.5 Surface Vater

The SSFL is located on a plateau in the Simi Hills. Ninety percent of the facility drains to the southeast through Bell Canyon Creek (7). Approximately five miles from the site, this creek joins the Los Angeles River, vhich flovs through Los Angeles to the Pacific Ocean at Long Beach (13). The other 10 percent of the site drains north into the Simi Valley through ephemeral drainages in Runkle and Meier Canyons. These canyons meet up vith Arroyo Simi or Conejo Creek about three miles north of the facility. These streams merge near Camarillo to form Calleguas Creek, vhich then flovs to the Pacific Ocean at Point Magu (2).

3.6 Air

Air pollution controls and permits at the SSFL are regulated by the Ventura County Air Pollution Control District (VCAPCD). Most of the permitted facilities are conventional combustion units, with the exception of the coal gasification unit, the sodium heaters, the low nitrous and sulfurous oxide combustor, and the sodium burn facility. VCAPCD inspects the facility regularly and has found it in full compliance with its permits (16).

TCE and other organic chemicals are highly volatile, and with the high concentrations of TCE found in the groundwater, the potential for a release of contaminants to the air due to the use of contaminated groundwater must be considered. There are two carbon adsorption/air stripping towers that operate as part of the on-site groundwater extraction and treatment program. VCAPCD claims that no detectable concentrations of TCE are being released from these towers (16).

TCE-contaminated groundwater is used to flush rocket engines after testing. The flush water is made up of about 15 percent groundwater with an average TCE concentration of 600 ug/l . The other 85 percent of the flush water is supplied municipal water. Approximately 80 to 300 gallons of water are used in a five minute period for each test (16). Because of the low volume of contaminated water used and the short duration of the flush, the amount of TCE potentially released to the air from these operations is probably low.

TCE is also still used as a solvent flush following rocket engine tests (3). There is reportedly a TCE capture system in place, but the details were not available for this report. It is not known if any TCE is released to the air or the surface water impoundments from these tests. TCE in the surface impoundments would evaporate into the air, the amount depending on its concentration. Additional information is needed to determine if these testing sites and surface impoundments may potentially release hazardous concentrations of TCE to the air.

In the early days of rocket testing, rocket fuels contained high levels of beryllium. Particles of beryllium were released to the air and settled on the soil around the facility. Rockwell states that the beryllium-contaminated soils were removed after the use of beryllium-containing fuels was discontinued. There is some concern, however, that there may still be concentrations of beryllium in the soil that, when picked up by the wind, could pose a threat to human health (17).

Radionuclides have been emitted from three sources in Area IV of the SSFL: the Radioactive Material Disposal Facility (RMDF), the Hot Laboratory, and the Nuclear Materials Development Facility (NMDF). The RMDF consists of several buildings where radioactive wastes are decontaminated and packaged for off-site disposal. The Hot Laboratory is used principally to examine irradiated fuel and prepare it for reprocessing. It is licensed by the Nuclear Regulatory Commission (NRC) under Special Nuclear Materials License SNM-21. The Hot Laboratory has been undergoing reconstruction since 1987, and operations involving

A review of recent reports prepared to assess the hazard potential from various parts of the facility show that there are several waste management facilities at the site that may have introduced hazardous chemicals into the environment. There are eleven surface impoundments that are regulated under the Resource Conservation and Recovery Act of 1976 and are undergoing closure or have been closed. Approximately 870 tons of wastes, consisting of organic solvents, hydrazine fuels, oxidizers, and others, were released to nine of these ponds in 25 years of use. Most of these ponds had either inadequate or no linings.

In addition to surface impoundments, there were several waste and equipment storage areas where drums of wastes were stored possibly without proper spill containment. Two areas have released contamination to soil and/or groundwater, and pose a continuing threat to the environment. These areas are the Old Sodium Burn Pit and an area near the Sodium Burn Facility. Soil near the Burn Pit is contaminated with organic compounds, metals, polychlorinated biphenyls, metals, cesium-137, and other contaminants. Asbestos was found in a runoff sample taken behind the Sodium Burn Facility (Building 133).

Extensive groundwater testing has shown that the groundwater beneath the facility is contaminated with volatile organic compounds. Trichloroethylene has been found in one well at concentrations of at least 5,200 micrograms per liter. The maximum contaminant level for drinking water for trichloroethylene is 5 micrograms per liter. Off-site well testing has not shown any groundwater contamination migration away from the facility, although this may be due to a lack of effective off-site monitoring. There is extensive on-site groundwater pumpage that may be preventing groundwater flow from leaving the site.

Groundwater is not used as a primary source of drinking water within three miles of the site. Most of the area is provided with potable water by water purveyors that receive their water from the Metropolitan Water District of Southern California. The District imports the water from distant surface waters. There are potentially 400 private domestic wells within a three-mile radius of the site. It is possible, however, that many of these wells are inactive due to the current availability of municipal supplies and the relatively high salinity of the groundwater. The facility uses groundwater for sanitation, industrial, and cooling purposes, but provides bottled water for drinking.

Most of the surface water runoff from the site is regulated through the facility's water reclamation system. The facility has a discharge permit for two release locations that are tributary to the Los Angeles River. Surface water runoff from the northern ten percent of the facility may not be collected in the on-site system and drain into canyons leading into the Simi Valley. Two areas of soil contamination fall into this area and may contaminate runoff with polychlorinated biphenyls, organic solvents, metals, and asbestos. Surface water is not used for any purpose except possibly groundwater recharge, and then only in periods of high rainfall. There are no documented sensitive environments within one mile of the site, but a federally endangered species may reside in the Arroyo Simi, the drainage channel that site runoff enters three miles from the site.

kj/kj/rockvell/sum

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13. Upper Los Angeles River Area Watermaster, Watermaster Service in the Upper Los Angeles River Area, Los Angeles County, October 1, 1986 - September 30, 1987, May 1988.

kj/kj/rockvell/ref

CONTACT REPORT

AGENCY/AFFILIATION: Ventura Co. Air Pollution Control District		
DEPARTMENT :		
ADDRESS/CITY:		
COUNTY/STATE/ZIP:		
CONTACT(S)	TITLE	PHONE
1. Al Danzig		(805) 654-2806
2.		
E & E PERSON MAKING CONTACT: Karen Johnson		DATE: 7/12/89
SUBJECT: Air Emissions		
SITE NAME: Rockwell SSFL	EPA ID#:	

Mr. Danzig does not feel there is an air emissions problem at SSFL. They regularly monitor and inspect for compliance and for several years at least, the SSFL has been in compliance.

TCE - there are 2 air stripping towers as part of their GW decontamination effort. These towers have charcoal absorbers (?) and emissions from towers have shown no detectable concentrations of TCE.

The facility also uses contaminated water (600 ppb TCE) in their rocket wash/cool down process. They use 15% contaminated (600ppb TCE) w/85% fresh water at a volume of 80 to 300 gallons per test. Each test lasts for about 5 minutes. This test doesn't violate any standards and the TCE volatilized is barely above background.

No actual air monitoring for concentration with respect to background has been done, however, the State Air Resource Control Board will be doing some monitoring/sampling soon.

In Mr. Danzig's opinion, the APCD can say there's no air emissions problem because the know the sources, and they are low but no sampling has been done.

vp/kj/rockwell/srv-cvm-cr

CONTACT REPORT

AGENCY/AFFILIATION:		
DEPARTMENT : Air Toxics		
ADDRESS/CITY:		
COUNTY/STATE/ZIP:		
CONTACT(S)	TITLE	PHONE
1. Mike Stenburg		
2.		
E & E PERSON MAKING CONTACT:		DATE:
SUBJECT:		
SITE NAME:	EPA ID#:	

There are 10 or more permits issued by the APCD for air emissions. There is no permit for the quenching operation that uses TCE contaminated GW.

There is some concern about beryllium in the soil being picked up in the wind. Be was used in rocket propellants until 1968. Rockvell says that contaminated soil has been removed, but Mr. Stenburg questions the thoroughness.

With respect to TCE and Be, there definitely needs to be some air sampling!

CONTACT REPORT

AGENCY/AFFILIATION: DOHS		
DEPARTMENT : TSCD		
ADDRESS/CITY:		
COUNTY/STATE/ZIP:		
CONTACT(S)	TITLE	PHONE
1. Florence Pearson	Senior Haz Mat Spec.	(818)567-3100
2.		
E & E PERSON MAKING CONTACT: Karen Johnson		DATE:7/13/89
SUBJECT: DOHS feelings about site		
SITE NAME: Rockwell SSFL	EPA ID#:	

She said that the DOHS does not know enough about the facility and its current activities to determine if there are still activities that could release contaminants.

The next step for DOHS is to do an RFA for the entire facility. She does not thing there are any immediate concerns and the RFA may not be done right away.

CONTACT REPORT

AGENCY/AFFILIATION: Ventura County Public Works		
DEPARTMENT : Flood Control and Water Resources		
ADDRESS/CITY:		
COUNTY/STATE/ZIP:		
CONTACT(S)	TITLE	PHONE
1. La Verne Hoffman	Hydrologist	(805) 654-2907
2.		
E & E PERSON MAKING CONTACT: Karen Johnson		DATE: 7/15/89
SUBJECT: GW Usage		
SITE NAME: Rockwell SSFL		EPA ID#:

Mr. Hoffman was cited as part of the reference in the PA for Area II as stating that there are 400 domestic wells within 3 miles. I asked him if he knew how many were currently active. He suspected that at most only a handful were still operating. No wells have been drilled recently and most of the area is now provided with municipal water. He said that 10-12 years ago, he did a well canvass in Section 16 and along Smith Road there were some wells active. He said that the only way to know for sure would be to go out and canvas the area now.

CONTACT REPORT

AGENCY/AFFILIATION: Ventura County Water Works District #8		
DEPARTMENT:		
ADDRESS/CITY: Simi Valley		
COUNTY/STATE/ZIP: Ventura, CA		
CONTACT(S)	**TITLE**	**PHONE**
1. Chip Townsend	Water Supervisor	(805) 583-0393
2.		
E & E PERSON MAKING CONTACT: Karen Johnson		**DATE:** 2/9/89
SUBJECT: Water use in Simi Valley		
SITE NAME: Rockvell SSFL #1 and #2	**EPA ID#:**	CAD982399719 CAD982399776

All water for the Simi Valley (including the Rockvell Facility) is provided by WWD#8. They get the water from MWD from the Colorado River or N. CA. No GW is used at all. Meier Cyn residents also use MWD water (from Las Virgines Water district). The Arroyo Simi is not used in the Simi Valley. Chip thinks that the water that occasionally flows down to Oxnard is diverted there and used as recharge for the aquifer beneath the Oxnard Plain.

Flats lung disease discovered

Doctors study deadly effects of beryllium

By Mark Obmascik
and Thomas Graf
Denver Post Environment Writers
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Rocky Flats nuclear weapons plant workers, who have worried for decades about the dangers of radioactivity, are now facing another deadly threat caused by on-the-job exposure to a key manufacturing metal.

Doctors so far have confirmed 12 cases of lung-ravaging beryllosis among workers who have handled beryllium, a gray metal used in the manufacture of plutonium triggers at the federal complex 16 miles northwest of Denver.

No deaths have been reported, but the incurable disease usually proves fatal to 30 percent of all people who contract it, doctors said.

The disease was found at Rocky Flats during a $2 million medical study financed by the Energy Department and the National Institutes of Health. The study is being run by Denver doctors from the National Jewish Center for Immunology and Respiratory Medicine and the University of Colorado Medical School.

Researchers say it's the world's biggest workforce study of beryllosis. So far, diagnostic tests have been administered to 391 of the more than 750 Rocky Flats workers exposed to beryllium. The study is scheduled for completion in 1993.

"This study will have an impact on every beryllium operation in the world," said Dr. Lee Newman, an assistant CU medical professor leading the research with Dr. Kathleen Kreiss of National Jewish.

Please see FLATS on 19A

BERYLLIOSIS

WHAT IT IS: An incurable lung disease caused by an allergic reaction to beryllium, a strong but lightweight metal that is often used in the nuclear and aerospace industries, and sometimes golf clubs.

SYMPTOMS: Shortness of breath, dry cough, fatigue, loss of appetite. The disease is fatal in 30 percent of the cases.

WHO'S AT RISK: More than 750 Rocky Flats workers — and hundreds of thousands of others across the nation — who may have breathed beryllium dust or gotten beryllium splinters during manufacturing operations.

The Energy Department released records detailing the beryllium study after The Denver Post requested them under the federal Freedom of Information Act. To preserve the privacy of patients, the names and ages of the stricken workers were withheld.

Beryllosis presents tough problems for medical researchers because the disease usually remains dormant for 10 years after the metal lodges inside the body. The Denver researchers now are trying to develop tests that will warn the Energy Department in advance whether an individual worker is susceptible to the disease.

Beryllium is a strong, light-weight metal that increasingly is being used in nuclear, aerospace, telecommunications and computer industries, as well as in ceramics, dental alloys, car parts and golf clubs.

Contact with finished beryllium products isn't hazardous, Newman said. But the estimated 800,000 American workers who have been exposed to beryllium dust in 93,000 private and government plants across America are considered to be at risk for the disease.

At Rocky Flats, the Energy Department has spent $2 million in the past four years on a program to improve safety conditions and reduce airborne beryllium concentrations in manufacturing areas, said department spokesman Pat Eichart.

"We've installed high-velocity, low-volume ventilation systems and more efficient containment hoods in process areas," Eichart said. "A safety training program for all workers in those areas has also been initiated and medical monitoring was strengthened."

However, during an environmental audit of the plant last summer by a special team of Energy Department investigators, Rocky Flats was cited for not following the proper federal and state procedures in monitoring beryllium emissions from smokestacks.

Rocky Flats' new operator, EG&G Inc. of Wellesley, Massachusetts, said it is protecting workers from airborne beryllium dust by insisting on a factory standard twice as tough as the guideline set by the Occupational Safety and Health Administration.

The Environmental Protection Agency has linked beryllium to cancer in laboratory animals. More than 60,000 pounds of beryllium were released into the environment by the nation's industries in 1987, according to EPA statistics.

Beryllium can kill a worker relatively quickly if massive amounts of dust are inhaled all at once. But more common is chronic beryllosis, which develops slowly.

Early signs of the slowly developing disease are shortness of breath, nagging coughs, fatigue and a loss of appetite.

The disease results when the body recognizes beryllium dust or splinters as a foreign substance, spurring tremendous production of white blood cells. If beryllium has been inhaled, the lungs suffer from progressive scarring that makes breathing difficult.

For reasons not yet known to scientists, only a small fraction of [illegible] are

EPA
Office of Radiation Programs
Las Vegas Facility
P.O. Box 98517 Las Vegas, NV 89193-8517 (702) 798-2476 FTS 545-2476

Report on Environmental Samples Collected at the Rocketdyne Santa Susana Field Laboratory July 1989

Gregg Dempsey, Branch Chief
Field Studies Branch
Office of Radiation Programs
Las Vegas Facility
November 8, 1989

I. FOREWORD

On July 12 and 13, 1989, personnel from the U.S. Environmental Protection Agency went to Rockwell International's Santa Susana Field Laboratory, near Simi Hills, CA to review laboratory operations and collect environmental samples. The samples were collected from specific areas onsite where evidence of radiological or hazardous materials contamination had been found.

This report addresses only radiological analyses performed by the contractor used by EPA for this project, Controls for Environmental Pollution, Inc. (CEP). Samples were collected and shipped with EPA direction by the EPA technical assistance team contractor, Ecology and Environment, Inc.

Delays were encountered during EPA review of CEP data because it was discovered that CEP had made an error that reduced the number of radionuclides that were reported. In order to assure validity and quality of data, EPA requested complete spectral, radioisotope library, and minimum detectable activity data on each environmental sample collected. This review process necessitated that CEP provide additional information and served to delay this report.

EPA is satisfied with CEP data quality. Reanalysis of any sample is unwarranted.

The transmittal submitted to Region 9 by Gregg Dempsey of the Office of Radiation Programs - Las Vegas Facility, dated July 28, 1989, should be referenced for further details on the sample locations discussed in this report.

II. ABBREVIATIONS AND TERMS

Several abbreviations and terms are used in describing the analyses:

1. Gamma Isotopic Analysis - This is an analytical technique which uses a device sensitive to penetrating gamma rays called an intrinsic germanium detector. The sample, be it soil or water, is placed in a specially calibrated counting container, called a counting geometry, for analysis. Soil samples are often dried prior to placement in the counting geometry. A specialized computer is used to record a spectrum of gamma energies which is them compared with two calibration factors - one is an energy calibration which determines that a "peak" in the spectrum is a certain energy, and the other factor takes into account the counting geometry and thereby enables the computer to convert a spectrum into a specific analytical result. Results are often expressed in pCi/L (picocuries per liter) or pCi/g (picocuries per gram). The fact that an analysis can be expressed in terms of

III. ENVIRONMENTAL SAMPLE ANALYTICAL RESULTS

Old Sodium Burn Pit

The Old Sodium Burn Pit was an area where radiologically contaminated materials had been dumped at some time in the past. The area was posted with "Caution - Radioactive Materials" signs around the perimeter of the two pits. Walking surveys with a gamma survey instrument indicated what is probably only background levels of radioactivity. The upper pit had moisture in the soil at its lowest spot. One separate sample plus a duplicate was collected in the upper pit to be analyzed for gamma emitting isotopes and for tritium through azeotropic distillation. One sample was collected in the lower pit for gamma isotopic analysis only since this pit was completely dry.
Results of analyses are below:

Upper Pit

Sample Type: Soil
Requested: Gamma Isotopic, Tritium (by Azeotropic Distillation)

Gamma Results:

K-40	9.76 ± 1.68 pCi/g
Pb-212	0.54 ± 0.10
Pb-214	0.19 ± 0.18
Ra-226	0.56 ± 0.19
Ac-228	0.79 ± 0.34
Tl-208	0.81 ± 0.22
Bi-214	0.28 ± 0.10
Cs-137	0.90 ± 0.22

Tritium Results:

H-3	0.59 ± 0.11 pCi/g soil

Leach Field

The Leach Field is the site of a former sewage leach field that had radioactive materials accidentally dumped into it at one time. SSFL had initiated a cleanup that removed soil down to bedrock and then restored the land. Walking surveys with a gamma survey instrument indicated what is probably only background levels of radioactivity. Results of the analysis of the sample collected in this area is below:

Sample Type: Soil
Requested: Gamma Isotopic Only

K-40	31.05 ± 1.27 pCi/g
Pb-212	1.88 ± 0.09
Pb-214	1.11 ± 0.18
Ra-226	1.27 ± 0.13
Ac-228	2.15 ± 0.73
Tl-208	1.58 ± 0.17
Bi-214	1.41 ± 0.53
Cs-137	1.02 ± 0.05

As in the case of the Old Sodium Burn Pit, the isotope levels encountered are representative of natural background.

Building 59, Former Reactor Building

Building 59 was the location of an old test reactor that was removed at some time in the past. Walking surveys with a gamma instrument indicated background levels of radiation. Supposedly sand from the area around the building had been contaminated with cobalt-60 and a french drain had been installed in the subfloor to collect infiltrating groundwater. This small quantity of water is pumped to the surface and analyzed. Two separate samples were collected for analysis:

Sample Type: Water
Requested: Tritium

H-3 1890 ± 538 pCi/L

Sample Type: Water
Requested: Gamma Isotopic

Reportable Gamma's NOT DETECTED

In the case of both samples, all gamma emitters are reasonably consistent with background, with the exception of cesium-137. This is directly attributable to this spill. Rocketdyne was in the process of cleaning up this area when this sample was collected. Further samples should be collected to verify that this cleanup has been completed.

IV. SUMMARY AND CONCLUSIONS

From the samples collected at SSFL, it is evident that contamination exists on site property. From the levels of contamination detected and their location, it is doubtful that contamination has spread offsite. SSFL personnel were apparently unaware of the presence of tritium at Building 59. While not an environmental concern or health risk, the source of this tritium needs to be investigated. It should also be documented that the cesium-137 around Building 64 is brought back to background levels following SSFL cleanup.

In the original report documenting the survey and collection of samples on this site, dated July 28, 1989, it was stressed that certain types of samples were not collected due to time constraints and difficulty of obtaining a contractor laboratory capable of performing those specific analyses required. For a follow-up study, it is first recommended that more water samples be collected and analyzed for tritium. At least a representative group of samples should be analyzed for strontium-90, a beta emitter whose use is known at the site. Since this analysis is difficult in soil, vegetation, and other media, a contractor laboratory must be chosen carefully. It is also recommended that vegetation and other media, specifically samples from feral species be collected and analyzed as warranted.

The Office of Radiation Programs - Las Vegas Facility has presented the Region 9 Office in San Francisco a proposal to assist the region and state in their efforts to bring the SSFL investigation to a close and allay questions that have arisen concerning the SSFL environmental program.

Rockwell contamination spreading toward Simi

No immediate risk from ground water seen

By BETH BARRETT
Daily News Staff Writer

Federal and state regulators said Thursday that new tests show toxic chemical contamination of ground water is moving from Rockwell International's Santa Susana Field Laboratory toward Simi Valley.

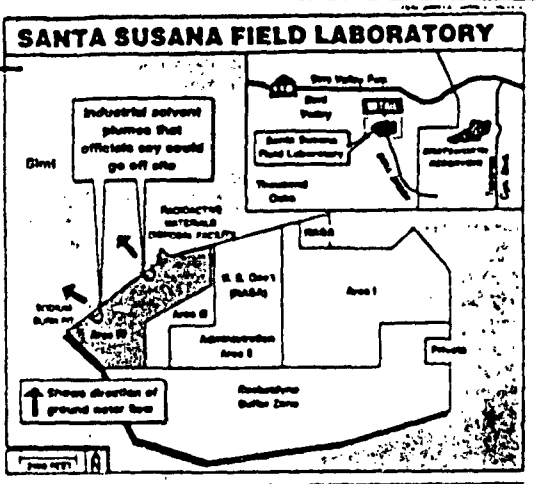
At a federal-state task force disclosed findings at a public meeting in Simi Valley, company officials said they will drill new off-property wells to determine the extent of the contamination.

"There were two surprises," said Jim Ross, senior engineer for the California Regional Water Quality Control Board. "The concentration of the organics (toxic chemicals) was higher than we thought, with the potential to flow off the site greater than we thought."

Ross was among 10 federal and state regulators attending the interagency task force meeting at the Simi Valley City Council chambers.

The task force was formed under the direction of the U.S.

See ROCKWELL / Back Pg.



ROCKWELL From Page 1

Environmental Protection Agency after the Daily News disclosed May 14 that a Department of Energy survey had found toxic and radioactive contamination at the 42-year-old nuclear and rocket test facility, three miles west of Chatsworth. The report said there was no immediate health risk but more testing was needed to determine the extent of the pollution.

The potential off-site contamination was found in tests conducted by state water officials on a series of new wells that were dug after disclosure of the contamination problems. Results of tests for radioactivity are not yet available.

Officials from seven agencies agreed Thursday that the toxic industrial solvent trichloroethylene (TCE) probably could not have traveled far from the facility's boundary, based on previous tests of springs and wells some distance from the property. The nearest drinking water well is over a mile from the lab, Ross said.

"There is no additional health risk," said Rich Valle, regional assistant director of the EPA's Toxics and Waste Management Division.

"We knew the (chemical) plumes were under the site, and now, we're going to put in monitoring wells to see if they have gone off site," he said. "The important thing is that we fully characterize the plumes so the water can be pumped and treated."

Paul Sewell, spokesman for the company's Rocketdyne Division, said previous assurances that contamination had not spread off the 2,600-acre research lab in the Simi Hills referred to radioactive contamination only. Test results for radioactivity in the new wells won't be available for a month or two, said Steve Lafflam, Rocketdyne's environmental manager.

"The question (of off-site migration) so far has focused on the radioactivity," Sewell said.

The new data showing the potential for off-site chemical contamination comes from 19 wells drilled in the nuclear section, or Area IV, last fall after local, state and federal officials pushed Rocketdyne for more monitoring in response to the disclosure of the DOE environmental survey.

The 1988 DOE survey of the 290-acre nuclear test portion of the lab found toxic chemical and radioactive contamination of the environment.

The Daily News reported Thursday the results of the new well sampling, which showed for the first time that TCE is a problem under the site where nuclear research was conducted for the DOE over four decades, regulators said.

The Dec. 5 report by Phoenix-based Groundwater Resources Consultants Inc. found high levels of TCE in 70 percent of the new wells. The recommended state safety level for TCE in drinking water is 5 parts per billion (ppb). One well sample on the Rocketdyne site contained 1,200 ppb, and another near the boundary tested at 660 ppb, Ross said.

TCE is thought to be a human carcinogen based on laboratory tests involving animals.

The company has proposed drilling two new monitoring wells off their property, but Ross said he is recommending four to eight wells downhill from the facility toward Simi Valley.

"They need to go a safe distance," Ross said, adding the wells must be fairly deep. "If it (the chemical contamination) is deep, it could reach higher quality aquifers that potentially could be used for drinking some day."

Water-quality officials said Area IV will be added to a continuing $3 million cleanup operation of chemical ground-water contamination problems in the Air Force and NASA portions of the lab identified in 1985.

However, DOE official Jim Hartman said the agency may ask the Air Force or NASA to pay for the cleanup in Area IV if the solvents came from their operations.

The task force, created after Rep. Elton Gallegly, R-Simi Valley, ordered the EPA to take an active role following the May disclosures, met for the first time in public and with Rocketdyne officials present.

Represented on the panel were officials from two Ventura County environmental agencies, the state Department of Health Services, and Regional Water Quality Control Board, and the federal DOE, EPA and Nuclear Regulatory Commission.

During the six-hour meeting, company officials also presented the results of testing at 47 wells that showed no detectable traces of radioactive hydrogen, or tritium, in the ground water.

In September, the EPA said it found a sample of ground water contained low levels of tritium in the vicinity of Building 59 where a prototype of a space-based nuclear reactor was tested in the mid-1960s.

Lafflam said retesting at that site by the company found no detectable tritium. However, he said the test results were not necessarily contradictory to the EPA's because radioactivity is difficult to measure at very low levels.

"Their number is a real number," Lafflam said. "That's why we're going to continue to watch in Area IV for tritium."

Reports by the DOE and EPA also called for additional environmental information from the facility and for improvements in monitoring methods.

The EPA is seeking additional data on any uncontrolled releases of TCE or other solvents into the air before deciding whether the Santa Susana lab should be placed on the National Priorities List under the federal Superfund program, according to documents released Thursday.

The DOE released a report by consultants, Oak Ridge Associated Universities, that made 17 recommendations on Rocketdyne's monitoring program. In July, EPA inspectors criticized the company's program and said it was unable to guarantee that contamination had not spread.

The Oak Ridge report concluded there is no evidence of radiological conditions posing an imminent threat to the public health or the environment.

Dec 15 1989 EXHIBIT 9

New Rockwell violations found

charges of improper hazardous-waste handling recorded against Simi research lab

y TONY KNIGHT
aily News Staff Writer

Five new violations of hazardous-waste laws were discovered during a December inspection of Rockwell International's research laboratory in the Simi Hills, state health officials said Monday.

The violations bring to 16 the number of hazardous-waste violations pending against the company, health officials said. They said the violations were revealed during routine inspections.

"This is a complex site and each time you go out there, you might look at something that you didn't check the first time," said Maxine Richey, the Toxic Substance Control Division's supervisor of surveillance and enforcement.

None of the new violations involve the nuclear research area of the laboratory, which has been the focus of concern since a U.S. Department of Energy environmental survey released last May revealed problems with radioactive soil contamination and chemical ground-water contamination at the site.

The DOE survey found no evidence of a public health threat and a cleanup is under way.

Health officials said Monday that none of the pending violations presents a health threat to workers or the public.

Eleven violations issued in August were referred to the state Attorney General's Office last week for enforcement action.

Rockwell's Rocketdyne Division, which operates the Santa Susana Field Laboratory three miles west of Chatsworth, was given until March 1 to correct the new violations.

But state officials said the five new violations, which were revealed in a Dec. 19 inspection, also were forwarded to the state prosecutor.

Company officials said they have scheduled a meeting with the state prosecutor to discuss all of the violations.

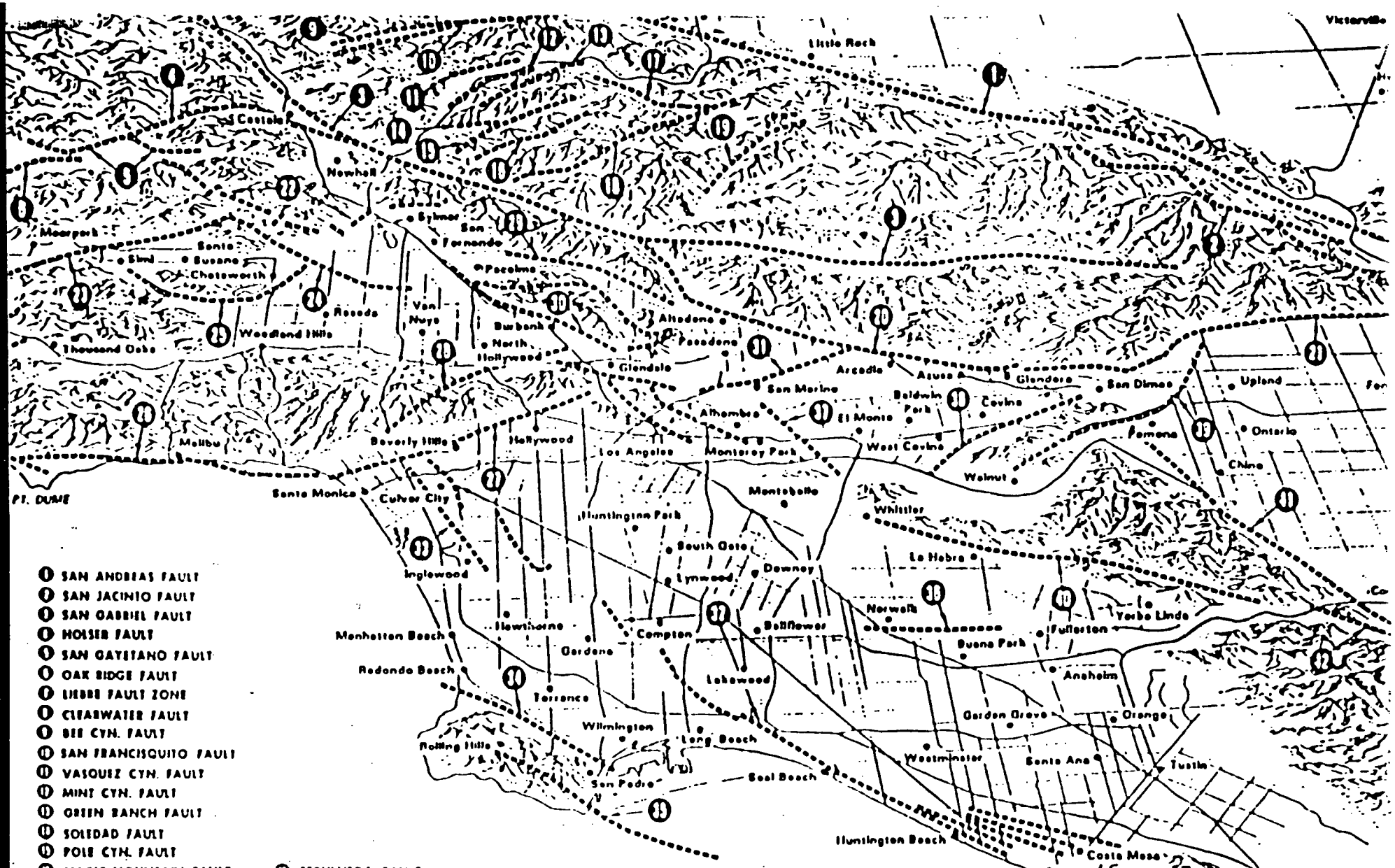
The new violations involve failure to properly document hazardous-waste shipping manifests, failure to properly document training of hazardous-waste workers, and illegal disposal and dilution of rocket fuel, state officials said.

Stephen Lafflam, Rocketdyne's environmental manager, said the company will provide documentation that will show compliance with shipping and training regulations.

The other violations involve a dispute between the company and toxics officials over a system that flushes spent residue of rocket fuel after rocket engines are tested.

Health officials contend that the nitrogen tetroxide residue from the rocket engines is a hazardous waste and must be either packaged and sent to a waste-disposal facility, or treated in the company's on-site waste-water treatment system.

Company officials contend the waste water is only slightly tainted with nitrogen tetroxide, does not qualify as a hazardous waste and can be released down Bell Creek under a permit from the state Regional Water Quality Control Board.



- SAN ANDREAS FAULT
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VEARTHQUAKES

N. Y. TIMES Oct 29, 1989

Cost of Cleaning Up Plant Waste In Nuclear Recycling Is Escalating

By MATTHEW L. WALD
Special to The New York Times

WEST VALLEY, N.Y. — Engineers arrived here in 1982 to begin cleaning up a factory that once processed nuclear waste. Their task was to employ a pioneering technology: remove hundreds of thousands of gallons of radioactive liquids and sludge from an aging storage tank and make the radioactive materials safe from spills or leaks by mixing them with cement or glass.

The job was expected to cost $400 million and take six to eight years to complete. But almost eight years into the cleanup, the work is at least six years from completion, and the cost estimate is up to $890 million. Meanwhile, the amount of work needed to make West Valley safe seems to be growing.

The West Valley project will be repeated at cleanups elsewhere. The United States Department of Energy faces this problem — what to do with wastes that will be radioactive for millenniums but are stored in tanks designed to last only decades — at two plants that manufacture nuclear bombs — in Savannah River, S.C., and Hanford, Wash., where even larger volumes are stored.

A Nuclear Edsel

Only the passing of years will reduce the radiation, but engineers say they can stabilize the material so it will stay put until time does its work. The job, which will cost billions of dollars, was described by one official here as producing a "quality waste product."

But as the liquids here are solidified, attention is turning to another environmental challenge: wastes that have been dumped in shallow trenches and holes, for which no cleanup strategy has been chosen.

West Valley is a nuclear Edsel. The plant processed used fuel from commercial and Government reactors, sorting it into components and recycling unused uranium and plutonium which was used in bombs and reactors. The plant became a business failure, and the simple recycling vision of the early 1960's produced a technological nightmare for the late 1980's.

Now Government officials and contractors are striving, amid disagreements with environmentalists, to avoid doing something in cleaning up West Valley that could be a nightmare for the next century.

Not all the waste was in tanks. A current nightmare involves the trenches where solid waste has been buried. Not even certain of what is there, planners here speak of their surveys with metal detectors, surveillance wells and sniffing tools as an attempt to "raise the confidence level" about their knowledge of what is underground and what may be leaking out.

The official in charge here, Willis W. Bixby of the Westinghouse Electric Corporation, a contractor, described part of what has been accomplished here as "peeling away the layers of the onion."

The stark concrete building in which the used fuel was reprocessed has beds of impatiens and geraniums in front. All around it are workers who have reduced the building's contamination so that more of its space can be used in the solidification operation. They are working toward tearing the factory down and restoring the entire 3,000-acre site, a job that could double the current $890 million budget.

The plant was lured to western New York by Gov. Nelson A. Rockefeller to help bolster the area's economy, and built for $32 million. It operated for six years, until it closed for modifications in 1972. It never reopened, partly because the Government insisted on earthquake precautions and the owners decided that they would be too expensive.

Its legacy was 600,000 gallons of wastes that will be radioactive for hundreds of thousands of years, in a tank designed to last for 40.

Continued on Page 16, Column 1

INSIDE

> The amount of work to make West Valley safe is growing.

EXHIBIT

By MATTHEW L. WALD

THE problem of what to do with wastes from making nuclear bombs has always been viewed as a long-term issue, posing no immediate threat to life. But events of the last few weeks have demonstrated to the Department of Energy that it can raise more immediate concerns.

Since the nuclear age began, hardly any of its radioactive byproducts have been permanently disposed of. The manufacture of the newest warheads continues to add to an unwanted collection of contaminated material that dates back to the Manhattan Project. The Federal Government is juggling all of it.

Lately, however, the act has gotten harder to keep up, because as the legacy of environmental damage from bomb-making has become clearer, officials in states where the wastes have been stored have begun to balk at accepting more.

The immediate crisis involves wastes contaminated with plutonium from the Rocky Flats plant on the outskirts of Denver. The material was supposed to go to the Waste Isolation Pilot Project, a repository in a salt dome near Carlsbad, N.M., but engineering problems have delayed the opening for years.

Now this failure threatens to shut Rocky Flats, where the Government makes plutonium triggers for thermonuclear warheads. Colorado officials, negotiating under provisions of a Federal anti-pollution law, have set a limit on the amount of material that can be stored at the site, and Gov. Cecil D. Andrus of Idaho, where plutonium has been sent for years, has refused to accept more after Sept. 1. Energy Secretary James D. Watkins suggested that other states that already have large bomb plants agree to store boxcars of waste. But so far there are no takers, and Rocky Flats will reach its limit by March.

At bomb plants, new fears of explosions.

Meanwhile, the Energy Department was reminded last week of other potential problems with its most intensely radioactive wastes, which have been in storage for decades. The wastes, now largely turned to sludges and salts, are in single-walled steel tanks at the Hanford nuclear reservation in Washington State. A report prepared by a government contractor in 1984 but which came to public attention only recently raised the possibility that cyanide compounds added to liquid wastes 35 years ago could cause a potentially explosive chemical reaction in the storage tanks.

Energy Department documents obtained under the Freedom of Information Act by the Hanford Education Action League, a citizens' group, show that Federal officials have known about the problem since 1964. League officials say the documents also show that an environmental impact statement in 1975 "contains no discussion" of the possibility of explosions and does not even list the cyanide compounds in the tank inventories.

A 1987 environmental impact statement said that such explosions are improbable, citing as evidence a report by another contractor. But that report was on a different subject and was cited in error, the documents show, and the report that should have been cited has not been publicly released.

Still, Energy Department officials maintain that the environmental impact statement with the error was proper, because it "made public the possibility" of an explosion. Jim Thomas, a researcher at the Hanford league, disagrees. "It's clear that the Department didn't want anybody to hear the bad news," he said. "It was irresponsible of them just to let this issue hang out there."

Federal officials insist that they have been studying the risk of explosion. The 1984 report that raised the question was not released because it "left some questions that needed to be answered," said Donald D. Wodrich, the manager of defense waste engineering at Hanford.

Across the continent, meanwhile, tanks filled with similar wastes at the Savannah River Site, near Aiken, S.C., generate hydrogen, an explosive gas, which is supposed to be vented regularly but has on occasion been allowed to accumulate. That part of the country is vulnerable to earthquakes, which could rupture the tanks, releasing their contents, and while the department says the tanks are adequate, it has had a history of engineering problems and environmentalists are not eager to run a field test. Some refer to the 1957 chemical explosion of bomb wastes at Kyshtym, in the Ural Mountains, which was recently confirmed by the Soviet Union.

"If you're using Kyshtym as your

More Ideas & Trends
Page 24

pose an equal or greater risk than the reactors," said Dan W. Reicher, an attorney at the Natural Resources Defense Council. The waste storage tanks generally contain radioactive material produced over decades by the reactors.

The solution, Federal officials say, is to change the form of the wastes. At Savannah River, engineers hope to start a process in 1991 through which they can incorporate the most radioactive material into a special high-strength glass. At Hanford, the Government plans to award a contract in January to build a plant for carrying out that process.

That is the short-term solution. Next comes the question of where to put the radioactive glass. The current leading candidate is Yucca Mountain, on the edge of the Nevada Test Site near Las Vegas, even though technical and engineering problems are multiplying.

But at least he problem of where to put the glass is a long-term one.

EDUCATION

NEW YORK TIMES
OCT 22, 1989

EXHIBIT 3.

LOS ANGELES TIMES OCT 19, 1989

California

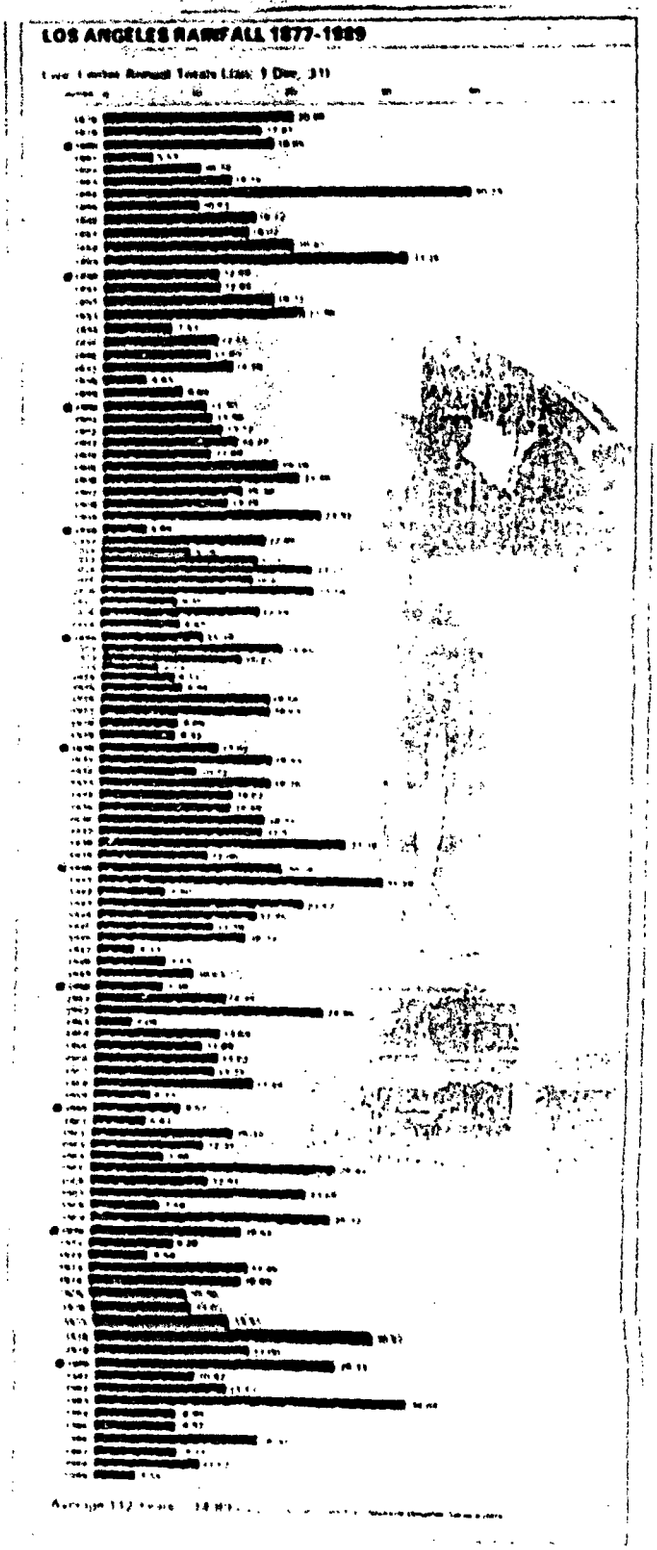
IN BRIEF

LIVERMORE

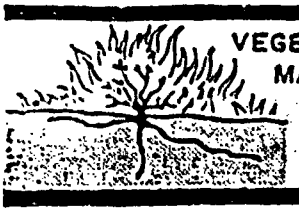
Nuclear Lab Reports Leak of Plutonium

A tiny spill of plutonium occurred in the Lawrence Livermore National Laboratory plutonium building as a result of a small leak in a rubber glove. Officials said the incident was not related to Tuesday's earthquake, and no injuries were reported. The quantity spilled was microscopically small and detectable only by sensitive radiation detectors, a spokesman for the laboratory said. Four workers in the room were screened. Two were found to have slightly contaminated hands, while one was found to have slightly contaminated hair. All were decontaminated, the spokesman said. The material spilled was plutonium-238, an isotope used for nuclear batteries.

LOS ANGELES TIMES OCT 19, 1989 EXHIBIT


LOS ANGELES RAINFALL 1877-1989

LOS ANGELES COUNTY FIRE DEPARTMENT



VEGETATIVE MANAGEMENT PROGRAM

JANUARY 12, 1990

LIVE FUEL MOISTURE SUMMARY

Location	Area	Species	% Moisture	
Bouquet Canyon	Saugus	Chamise	59	+4
[illegible] Canyon	Newhall	Chamise	59	-2
Placerita Canyon	Newhall	Chamise	67	+5
Templin Highway	Castaic	Chamise	58	+1
Stunt Motorway	Malibu	Chamise	68	+3
Schueren Road	Malibu	Chamise	73	-2
Trippet Ranch	Topanga	Chamise	60	-4
Woolsey Canyon	Chatsworth	Chamise	63	-4
Sycamore Canyon	San Dimas	Chamise	68	-11
Bouquet Canyon	Saugus	Black Sage	79	+22
Grasshopper Canyon	Castaic	Purple Sage	47	-7
Trippet Ranch	Topanga	Black Sage	104	+21
Grasshopper Canyon	Castaic	Sagebrush	60	-7
Schueren Road	Malibu	Bigpod Ceanothus	99	+6
Sycamore Canyon	San Dimas	Hoaryleaf Ceano.	68	-2
LaTuna Canyon	Tujunga	Chamise 4 WKS.	58	-6
Laurel Canyon	Hollywood	Chamise 4 WKS.	59	-7

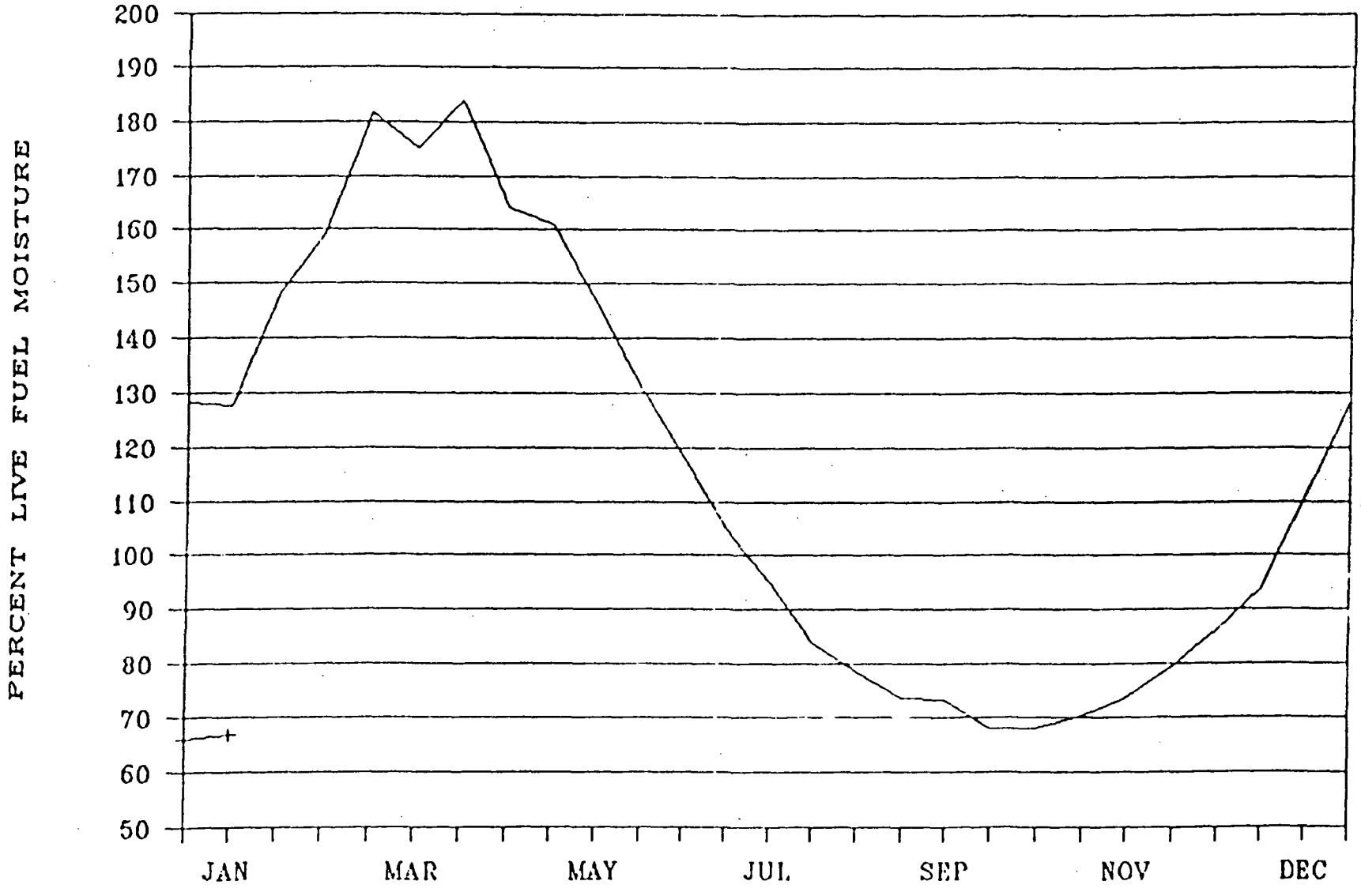
Area averages: Malibu 66 Saugus-Castaic 61

Notes _____

EXHIBIT 12/8

LIVE FUEL MOISTURE 1981-90

AVERAGE ALL AREAS - ALL FUELS

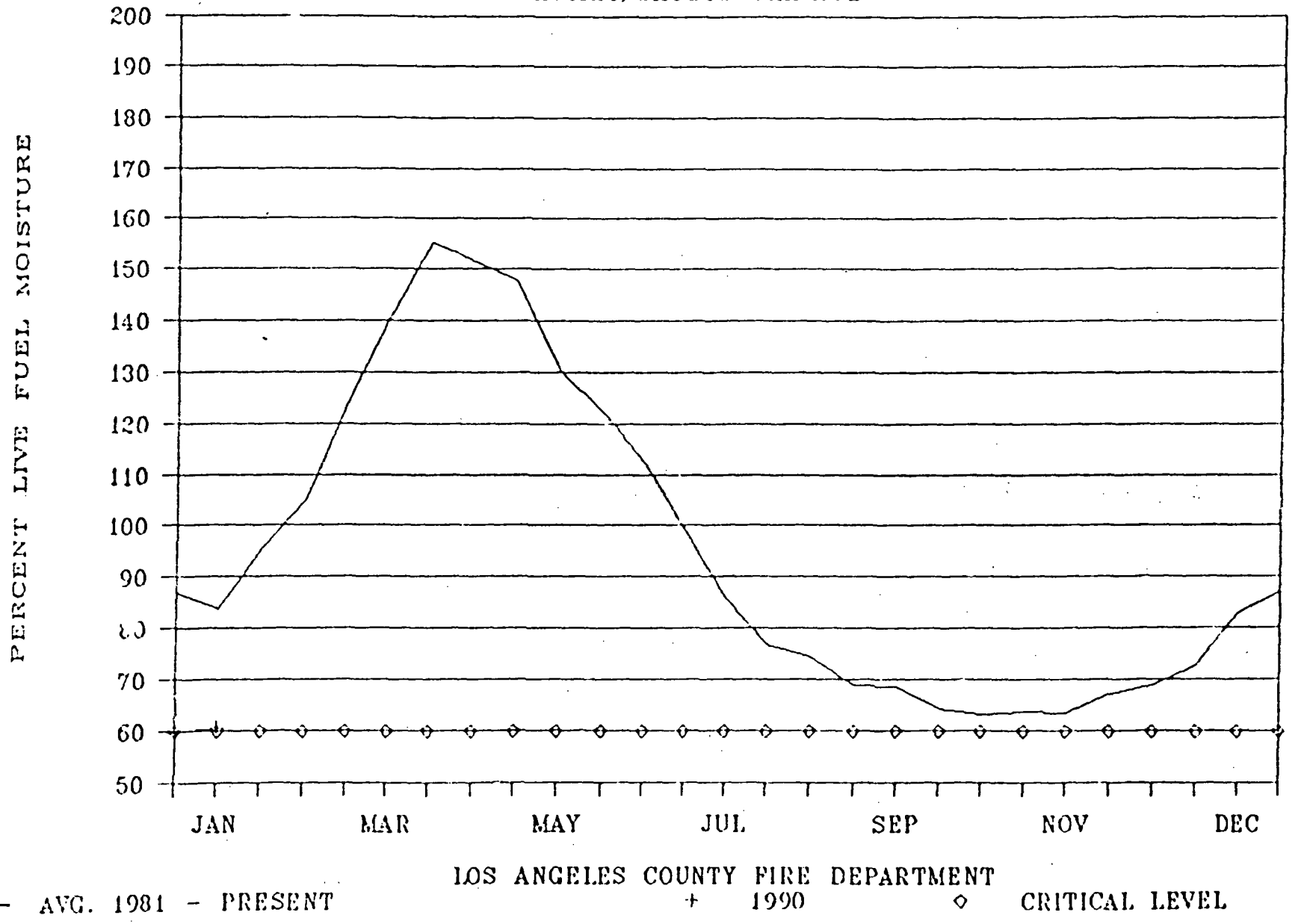


LOS ANGELES COUNTY FIRE DEPARTMENT

—— AVG. 1981 - PRESENT + 1990

LIVE FUEL MOISTURE 1981-90

CASTAIC/SAUGUS CHAMISE

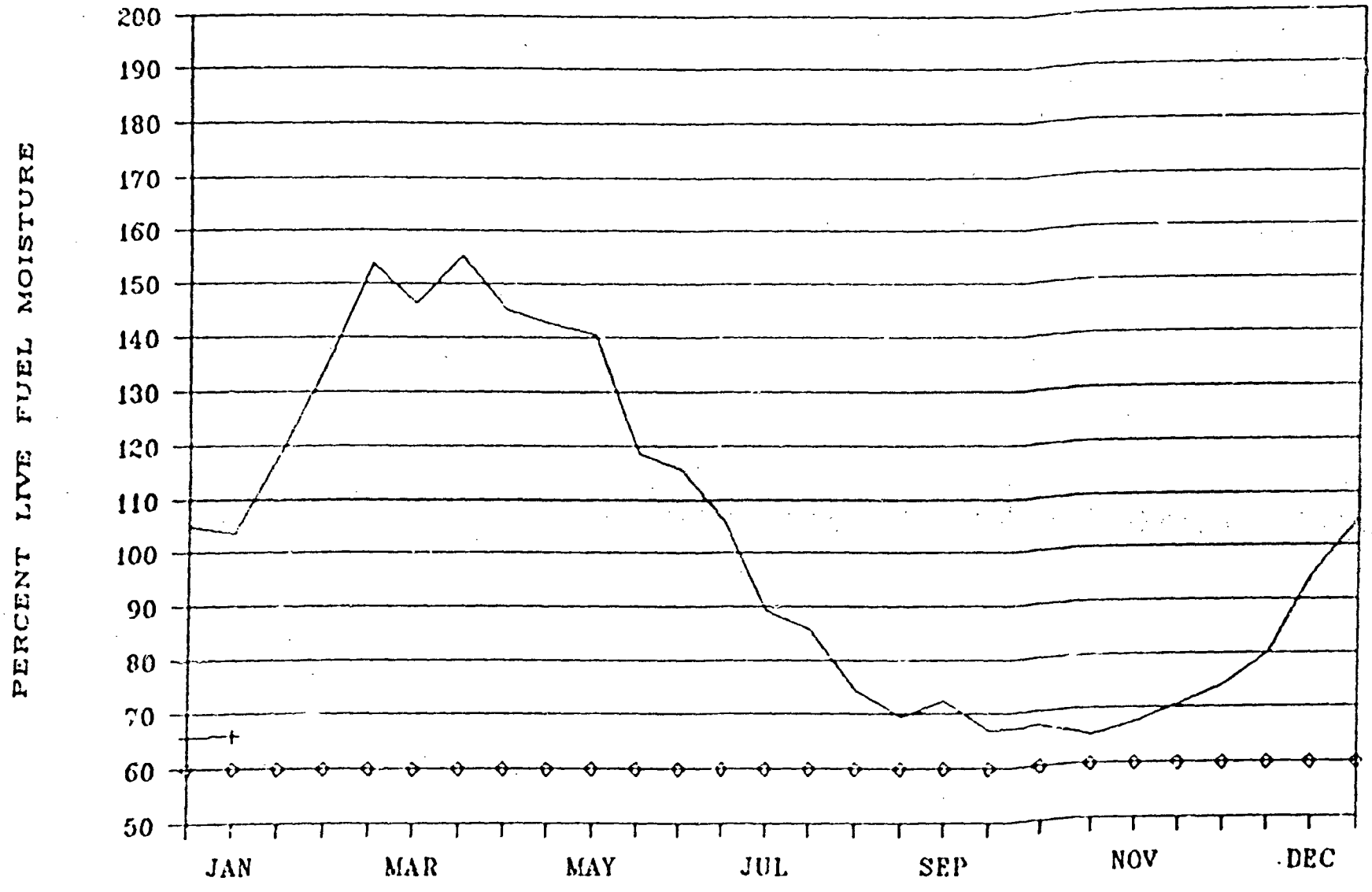


LOS ANGELES COUNTY FIRE DEPARTMENT

— AVG. 1981 - PRESENT + 1990 ◇ CRITICAL LEVEL

LIVE FUEL MOISTURE 1981-90

MALIBU CHAMISE



LOS ANGELES COUNTY FIRE DEPARTMENT

— AVG. 1981 - PRESENT + 1990 ◇ CRITICAL LEVEL

San Fernando, Santa Clarita
Conejo, Simi and Antelope Valleys

Katz Calls on State Officials to Oppose Rockwell's License

■ Environment: The assemblyman says the company and the DOE play 'radioactive Russian roulette' at a laboratory west of Chatsworth.

[illegible]

[illegible] Assemblyman Richard [illegible] Monday called [illegible] Deukmejian and Attorney General John Van de Kamp [illegible] anti-nuclear activists opposing Rockwell International [illegible] to renew a license to work with nuclear materials at its Santa Susana Field Laboratory [illegible] of Chatsworth.

In [illegible] five-page letters [illegible] Deukmejian and Van de Kamp [illegible] legal status to intervene [illegible] Nuclear Reg[illegible] so they could [illegible] application for a [illegible] to oper[illegible] at Santa [illegible]

[illegible] nobody ally [illegible] Department of Energy [illegible] Rockwell has been and continu[illegible] radioactive Russian roulette with the health and safety of the people of the San Fernando Valley," Katz said in the letters.

In making public the letters, Katz asked if there should "be any [illegible] nuclear work at all in densely populated areas like Los Angeles." He said there are restrictions on how far away from a school a bar must be [illegible] or a magazine rack [illegible], but not nuclear materials.

Spokesmen in Deukmejian's and Van de Kamp's offices said late [illegible] not seen and [illegible] on Katz's [illegible]

[illegible] judge for the [illegible] Commission [illegible] deadline [illegible] time for persons seeking to intervene and gain legal standing to file formal evidence in the case.

From the mid-1950s to the early 1980s, Rockwell operated 16 small nuclear reactors at Santa Susana for the DOE and also fabricated nuclear fuel. In recent years most of the nuclear work there has involved cleaning up contamination from past activities.

Until 1986, the hot lab was used to declad nuclear fuel—dismantling the fuel and removing plutonium and uranium for shipment to government reservations for use in nuclear weapons and fuel for naval ships. The company is seeking renewal of the hot lab license in hopes of gaining future decladding contracts from DOE.

A second Valley lawmaker—Assemblyman Terry Friedman (D-Los Angeles)—also weighed in on the issue Monday, saying he would push for funds and legal authority for state health officials to regulate the nuclear side of Rockwell's business.

The current situation—in which most health and safety oversight is done by DOE itself—is "like the fox guarding the chicken coop," said Friedman, whose district includes much of the Valley's southern rim.

"It's totally unacceptable to have an entity, DOE, operate as well as regulate its own operations," Friedman said. "I don't believe that we can rely on DOE either to monitor or clean up its own mess."

Both lawmakers appeared in Van Nuys at a public hearing of the Assembly Ways and Means subcommittee on health and welfare, which Friedman chairs. The hearing, which attracted about 55 residents and state officials to the Van Nuys State Office Building auditorium, was called by Friedman to investigate whether the state should play a role in regulating nuclear activities at Santa Susana and other DOE sites in California.

Friedman, whose subcommittee

Please see ROCKWELL, B3

Daily News

SERVING THE SAN FERNANDO AND NEIGHBORING VALLEYS

10/21/89

Rockwell to shut nuke lab

Cites community concern over Simi Hills facility; closure due in '9(

By MARK BARNHILL
Daily News Staff Writer

Rockwell International's laboratory for processing nuclear materials at the Santa Susana Field Laboratory in the Simi Hills will be closed within a year, company officials announced Friday.

Company officials — faced with challenges to their request for a 10-year extension of the "hot lab's" Nuclear Regulatory Commission license — said community concern over disclosure of toxic and radioactive contamination at the facility prompted the decision.

The request for a license extension for processing enriched uranium at the site will be amended to seek renewal only through Oct. 20, 1990, said officials of Rockwell's Rocketdyne Division, which operates the facility in the hills between Simi Valley and Chatsworth.

"In recent months there have been expressions of serious concern from the surrounding community about our nuclear work at SSFL," Rocketdyne's new president, Bob Paster, said in a statement.

"While the hot lab poses no threat to safety, health or the environment, we hope closure of the facility will allay concerns and will assure the public of our commitment to the community in which we live and work," Paster said.

Since the Daily News disclosed May 14 that a Department of Energy survey found contamination at 10 sites at the 42-year-old facility, Rocketdyne and state and federal regulatory agencies have faced growing criticism over the handling of nuclear materials near a heavily populated area.

The DOE report said contami-

See ROCKWELL / Back Pg.

Rockwell to Close Nuclear 'Hot Lab'

■ Environment: Activists are stunned by the firm's unexpected decision. The company says the shutdown of the nuclear materials research site will have a negligible effect on its business.

By MYRON LEVIN
TIMES STAFF WRITER

In a move that stunned but delighted its critics, Rockwell International announced plans Friday to close its nuclear "hot lab" at the Santa Susana field laboratory west of Chatsworth, which had become a lightning rod for protests by neighborhood and anti-nuclear activists.

Rockwell, which has been seeking a 10-year extension of a special nuclear materials license to operate the hot lab, said Friday that it will instead request renewal of the license only through next October to complete existing work and file a decontamination plan with the U.S. Nuclear Regulatory Commission.

"That is great! That is the best news I've heard in a long time," said Jim Werner, a project engineer with the Natural Resources Defense Council, an environmental group that had opposed the hot lab's relicensing request.

"You're kidding. . . . I think that's fantastic," said Jon Scott of Bell Canyon, who had intervened in license hearings before the NRC.

The decision was announced by Rockwell's Rocketdyne Division in a brief press release, and a company spokesman said officials would make no further comment. The press release said the amount of radioactivity to be handled in the hot lab for the remainder of its life will be less than that found "in a typical neighborhood hospital radiation therapy unit."

The company said that no job losses are expected and that the effect on its business "will be negligible" because of the small amount of present business for the hot lab.

The sudden announcement appeared to have caught some employees unaware. "I haven't heard there was a decision to close it," a Rocketdyne nuclear materials manager replied when asked for a comment.

Rockwell's prepared statement reiterated the company's contention—backed by federal Department of Energy and state and federal environmental agencies—that conditions at Santa Susana do not pose an immediate risk to health. "We . . .

While the hot lab poses no threat to public health or the environment, we hope . . . ure of the facility will allay concerns . . . will assure the public of our commitment to the community in which we live . . . work," Rocketdyne President Rob . . . announced in a statement.

Rockwell plans to cease [illegible] all Simi Hills nuclear work

By TONY KNIGHT
Daily News Staff Writer

Rockwell International will end its 40-year nuclear era at the Santa Susana Field Laboratory in the Simi Hills and completely decommission all facilities for handling radioactive materials, a company official said Saturday.

Officials of the company's Rocketdyne Division, which operates Santa Susana, will meet Monday to formulate plans to permanently cease nuclear operations at the mountain laboratory three miles west of Chatsworth.

[illegible] Rocketdyne's [illegible] Bob Paster, announced the company will withdraw its Nuclear Regulatory Commission application for a 10-year license renewal for its "hot lab" [illegible]

See ROCKWELL / Pg. 14

Rockwell to end nuclear era at laboratory in Simi Hills

ROCKWELL / From Page 1

heavily shielded workshop for handling radioactive materials.

Paster cited growing public concern over the proximity of the nuclear facility to the heavily populated San Fernando and Simi valleys as the main reason the company decided to close the hot lab within a year if the NRC extended its license until Oct. 20, 1998.

Rocketdyne had operated Santa Susana with only sporadic criticism over four decades until the Daily News reported May 14 that a U.S. Department of Energy survey had found radioactive and chemical contamination in the soil and ground water beneath the facility. The DOE survey said there was no immediate threat to public health but that more tests were needed because monitoring of contamination had been inadequate.

In a series of follow-up investigative articles, the Daily News disclosed that state and federal health and environmental officials were unaware of the extent of the contamination at Santa Susana and had done little independent monitoring.

Rocketdyne's statement Friday had left in question whether the company planned to end nuclear operations on the entire 290-acre nuclear reservation. Besides the hot lab, Rocketdyne operates a complex of more than a dozen buildings under the control of the U.S. Department of Energy and not subject to the NRC.

In the past, Rocketdyne and DOE officials had said they did not know whether nuclear research at the facility would continue in the future although they promised that all contamination problems would be cleaned up.

In an interview Saturday, Coult [illegible] said the company would continue research into rocket propulsion systems on the portions of the 2,6[illegible]-acre field laboratory that are controlled by the National Aeronautics and Space Administration and the U.S. Air Force.

"We're delighted if it means that they're going to get out of the nuclear [illegible]

intervened in the hot lab relicensing process [illegible]

Cleanup of the nuclear facilities at the site will continue as scheduled, company officials said. The DOE has prepared a $43.5 million plan to clean up most of the facilities over the next five years. But ultimately the cleanup could take years longer, officials said.

Lit said regardless of what happens with the licensing case, local citizens would continue to keep tabs on cleanup operations to make sure that they are completed as soon as possible and that no new nuclear work is contemplated at the site.

"We need more local people and our local regulatory agencies in charge of oversight," Lit said. "We just want to make sure that they aren't back in business a year later."

News that the company has given up seeking a license renewal for the hot lab was a clear victory for the intervenors, three average citizens who had succeeded in getting the NRC to grant them legal privileges to oppose the company in formal proceedings conducted by an NRC administrative law judge.

Lit, Jerome Raskin of Northridge and Jon Scott of Bell Canyon were granted intervenor status last month, and had been preparing for a long and complicated proceeding that would last at least 10 months.

"I think there were a lot of people who said we didn't have a chance," Scott said. "But I thought we did have a chance. I was definitely prepared to go all the way. I'm thrilled that this has happened, because in my mind any time you can stop plutonium and uranium from possibly affecting the entire San Fernando Valley, that's a victory."

NRC officials said the intervenors' case would remain in effect until the company files an amendment to it's license renewal application and Judge Peter B. Bloch has a chance to review it.

"It's up to the judge as to what to do," said Greg Cook, spokesman for the NRC regional office in Walnut Creek. "There will be some discussion with the parties even if it [illegible]

[illegible] in the field [illegible] 1950s to [illegible] facilities [illegible] by the past 15 years [illegible] DOE [illegible] facilities [illegible] May of the [illegible] the U.S. [illegible] Protection Agency [illegible] oversight of the cleanup [illegible] of Rep. [illegible] Simi Valley.

State regulatory agencies also began [illegible] investigations into [illegible] contamination [illegible]

[illegible] last week [illegible] Assemblyman Terry Friedman, D-Sherman Oaks, [illegible] in Van Nuys on nuclear operations at the site and called for [illegible] governing such facilities.

[illegible] D-[illegible] State Health Department Director Ken Kizer to begin an investigation into the health of past and present Rockwell workers and asked Dr. George [illegible] in the hot lab [illegible]

The hot lab, a heavily shielded workshop where irradiated nuclear fuel can be dismantled and processed into reusable radioactive materials, is the only NRC-licensed facility at the field laboratory.

Most of the nuclear reservation is controlled by the DOE and not under NRC jurisdiction. Eleven buildings where DOE research was conducted have been decontaminated and released for unrestricted use.

But the company and the DOE plan to decommission six additional buildings currently not in use. And plans are underway to decommission the hot lab and a nine-building nuclear waste disposal and packaging complex where extensive soil contamination problems have been identified.

In addition, a DOE environmental survey found soil contamination problems at a Sodium Burn Pit where waste chemicals and radioactive material were disposed of in the 1960s.

[illegible] plans to clean

Daily News

SERVING THE SAN FERNANDO AND NEIGHBORING VALLEYS

10/21/89

Rockwell to shut nuke lab

Cites community concern over Simi Hills facility; closure due in '9(

By MARK BARNHILL
Daily News Staff Writer

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Company officials — faced with challenges to their request for a 10-year extension of the "hot lab's" Nuclear Regulatory Commission license — said community concern over disclosure of toxic and radioactive contamination at the facility prompted the decision.

The request for a license extension for processing enriched uranium at the site will be amended to seek renewal only through Oct. 20, 1990, said officials of Rockwell's Rocketdyne Division, which operates the facility in the hills between Simi Valley and Chatsworth.

"In recent months there have been expressions of serious concern from the surrounding community about our nuclear work at SSFL," Rocketdyne's new president, Bob Paster, said in a statement.

"While the hot lab poses no threat to safety, health or the environment, we hope closure of the facility will allay concerns and will assure the public of our commitment to the community in which we live and work," Paster said.

Since the Daily News disclosed May 14 that a Department of Energy survey found contamination at 10 sites at the 42-year-old facility, Rocketdyne and state and federal regulatory agencies have faced growing criticism over the handling of nuclear materials near a heavily populated area.

The DOE report said contami-

See ROCKWELL / Back Pg.

Rockwell to shut down Simi Hills nuclear lab

ROCKWELL / From Page 1

nation posed no immediate threat to the public, but said the company's monitoring program was inadequate to determine the extent of contamination and more tests were needed.

Rep. Elton Gallegly, R-Simi Valley, who played a leading role in demanding full disclosure and cleanup of contamination at the field lab, said he has been working for several weeks to persuade Rocketdyne to close the hot lab.

"I am pleased that Rocketdyne understands its obligation to remain a corporate good citizen of our community," he said.

"Although I'm convinced the company has operated the hot lab in as safe and responsible a manner as possible, it is becoming more and more obvious that nuclear operations of this type should not be taking place in an area where 500,000 people live within a 10-mile radius," Gallegly said.

Assemblyman Terry Friedman, D-Sherman Oaks, who conducted an informational hearing last week into Rocketdyne operations, said he would [illegible] state action to speed [illegible] nuclear activities [illegible] which [illegible]

"I [illegible] and [illegible] month [illegible] said [illegible] that the [illegible] state [illegible] tinuation of the lab.

"[illegible] there [illegible] done [illegible] water and surface water [illegible] have the confidence in the Department of Energy because of its conflict of interest to do that. So what's vital is for the state to play an active watchdog role."

Assemblyman Richard Katz, D-Panorama City, who has [illegible] state [illegible] Department of Health Services operation, said Rockwell [illegible] was [illegible].

"[illegible] Valley," Katz said. "[illegible] what happened is that after [illegible] week's hearing, Rocketdyne realized we weren't going away. They've decided they want to take a new approach to their relationship with the community."

Los Angeles City Councilwoman Joy Picus, whose district includes West Hills near Santa Susana, applauded the company [illegible] decision to respond to [illegible] concerns.

"I've lived in [illegible] for 2[illegible] years and have [illegible] Rockwell International [illegible] good neighbor," she said [illegible] statement. "Their agreement [illegible] close the lab demonstrates [illegible] they are continuing in that [illegible]."

In the five months since the contamination problems were reported, federal, state and local officials have formed a task force to monitor the facility, and the Energy Department agreed to [illegible]

[illegible]

[illegible] between 195[illegible] and [illegible]. Most of the nuclear facilities have long since been [illegible] and extensive areas of contamination cleaned up.

But Rocketdyne has maintained its license to handle radioactive material in the hot lab, where workers with specially shielded equipment strip the metal cladding from irradiated fuel elements.

In announcing the decision, Rocketdyne officials said almost all work in the hot lab ended in 1986. The license extension through next year will allow the company to "complete current work in progress" and prepare a plan for decommissioning the facility, the company's statement said.

In June, Rocketdyne applied for a 10-year extension of its license to handle special nuclear materials at the hot lab.

The application was immediately opposed by a group of San Fernando Valley residents, alarmed at the proximity of radioactive materials to such a populated area and the disclosures of past contamination.

Their petition has triggered controversy within the NRC.

Peter B. Bloch, an administrative law judge considering the license renewal, ordered Rocketdyne in September to provide a complete history of radioactive spills at Santa Susana.

The company provided only a list of chemical spills, saying that any radioactive spills were trivial and not reportable under the judge's orders.

Bloch issued a new order demanding a list of all spills, regardless of whether they exceed NRC standards.

An NRC appeals panel then stepped in, asking Bloch to justify his "judicial activism" and explain under what authority he demanded the list.

Bloch granted community activists legal status to challenge Rocketdyne's license renewal. The NRC will determine whether or not to grant the extension.

CONTAMINATION AT SANTA SUSANA

Here is a chronology of key events involving Rockwell International's Santa Susana Field Laboratory since the disclosure May 14 of radioactive and chemical contamination of the facility in the hills between Simi Valley and Chatsworth.

- May 14: The Daily News reports that a 1988 environmental survey of Santa Susana by the U.S. Department of Energy found significant levels of radioactive and chemical contamination at the 290-acre nuclear research portion of the lab.
- May 16: Rep. Elton Gallegly, R-Simi Valley, demands a copy of the survey from DOE officials and the Daily News reports that Rockwell's Rocketdyne Division, which operates the lab, has been cited for 56 violations by the Nuclear Regulatory Commission since 1978.
- May 18: U.S. Environmental Protection Agency officials say they did not know the extent of radioactive work at Santa Susana when they decided in 1987 not to designate the facility a Superfund cleanup site.
- May 19: State health officials say they were unaware of contamination at Santa Susana and begin an inquiry.
- June 18: Rocketdyne officials acknowledge that tests in [illegible] turned up previously unknown areas of radioactive contamination.
- June 22: The EPA, under strong pressure from Gallegly, agrees to lead a full-scale review of contamination.
- July 1: State and federal officials agree to form a task force, headed by the EPA, that will develop a complete blueprint of contamination and determine the responsibility of each agency in cleaning up the site.
- July 7: Company documents show that radioactive "hot spots" up to 200 times above natural occurring levels were found the year before in soil near a septic system leach field above Simi Valley.
- Aug. 3: The Energy Department, in a draft report on cleaning up facilities nationwide, identifies certain contaminated areas at the facility as urgent Priority One projects that could cause [illegible] term adverse impacts to the public health and environment if not cleaned up.
- Aug. 12: The Energy Department, in a three-paragraph report to Gallegly, says Santa Susana poses no threat to the surrounding community.
- Aug. 17: State toxics officials ask the DOE to explain why Rocketdyne rejected their recommendation to dig a monitoring well 60 feet from a drainage pond that may be contaminated, and instead put the well 200 feet from the pond.
- Aug. 20: State health officials accuse Rocketdyne of violating 14 hazardous waste laws at Santa Susana.
- Aug. 31: A new EPA report concludes that Rocketdyne's environmental monitoring is inadequate and unable to guarantee that contamination won't spread to nearby communities.
- Sept. 12: Rocketdyne agrees to undertake a series of new steps to monitor radioactive contamination at Santa Susana, including testing vegetation and animals near the facility for exposure to radiation.
- Sept. 13: The Daily News reports that a 1982 internal document shows the company considered public disclosure of radioactive contamination at Santa Susana one of the biggest potential risks in coping with the problem.
- Sept. 19: The Nuclear Regulatory Commission [illegible] viewing Rocketdyne's [illegible] renewed license [illegible] the radioactive materials [illegible]
- Sept. 30: The Nuclear Regulatory Commission [illegible] grants three San Fernando [illegible] the right to oppose Rocketdyne's license renewal request.
- Oct. 1: Contamination inside two aging nuclear facilities at Santa Susana has been removed in the [illegible] months in a stepped-up environmental program as part of an estimated $45.5 million cleanup, company officials report.
- Oct. 17: At a legislative hearing [illegible] members [illegible] to add [illegible] environmental [illegible]
- Oct. 20: A [illegible] down the [illegible] Santa [illegible]

Rockwell to Close Nuclear 'Hot Lab'

■ Environment: Activists are stunned by the firm's unexpected decision. The company says the shutdown of the nuclear materials research site will have a negligible effect on its business.

By MYRON LEVIN
TIMES STAFF WRITER

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"That is great! That is the best news I've heard in a long time," said Jim Werner, a project engineer with the Natural Resources Defense Council, an environmental group that had opposed the hot lab's relicensing request.

"You're kidding . . . I think that's fantastic," said Jon Scott of Bell Canyon, who had intervened in license hearings before the NRC.

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Rockwell's prepared statement reiterated the company's contention—backed by federal Department of Energy and state and federal environmental agencies—that conditions at Santa Susana do not pose an immediate risk to health.

"While the hot lab poses no threat to safety, health or the environment, we hope closure of the facility will allay concerns and will assure the public of our commitment to the community in which we live and work," Rocketdyne President Bob [illegible] commented as saying.

ROCKWELL: Move to Shut 'Hot Lab' Stuns, Delights Activists

Continued from B3

announcement good news and "a reminder that an aroused citizenry can have an impact."

Said Assemblyman Richard Katz (D-Sylmar): "I want to give credit to the neighbors who wouldn't give up and credit to Rockwell for seeing the handwriting on the wall."

Rep. Elton Gallegly (R-Simi Valley), who in recent months had blasted such federal agencies as the DOE and Environmental Protection Agency for failing to properly regulate the Santa Susana lab—but had avoided criticism of Rockwell itself—said he had "been working for several weeks to persuade Rockwell to close the hot lab."

"It is becoming more and more obvious that nuclear operations of this type should not be taking place in an area where 500,000 people live within a 10-mile radius," he said in a prepared statement.

The decision appeared to reflect a calculation that the lab's limited business did not outweigh a torrent of bad publicity about the nuclear side of Rockwell's work.

As more citizens groups and legislators became interested in it, I think the level of scrutiny that they were going to be subjected to wasn't worth it in terms of the possible economic return they could get at this facility," said Mary Nichols, a senior attorney with the Natural Resources Defense Council.

The move also continued Rockwell's partial disengagement from federal nuclear work that began last month when the DOE and Rockwell announced the firm's withdrawal as manager of the problem-plagued Rocky Flats nuclear weapons plant near Denver.

[illegible]

work," said Donald Pearman, acting DOE manager in San Francisco.

But Pearman said nuclear activities were less likely after the hot lab, which would be needed for some types of work, is closed.

DOE officials also said the decision will not affect the pace or extent of cleanup work at Santa Susana. Over a seven-year period, the DOE has proposed spending about $45 million to clean up chemical and radioactive contamination in buildings, soil and water in the DOE area of Santa Susana.

Established in the late 1940s, Santa Susana occupies 2,668 acres on a rugged plateau in the Simi Hills southeast of Simi Valley.

Most of the lab is devoted to rocket testing for the National Aeronautics and Space Administration and the Air Force. A 290-acre swath of the property has been reserved since the late 1950s for nuclear and other energy work for DOE and its predecessor, the Atomic Energy Commission.

Largely unknown to the public, the site was once a major West Coast center for nuclear research, with 16 small nuclear reactors operating there from the 1960s to early 1980s. Nuclear fuel fabrication, in addition to decladding, was also done there.

Rockwell had sought renewal of the hot lab's license in hopes of attracting more decladding business from the DOE. The decladding, done from about 1960 to 1986, involved splitting open the metal rods encasing spent nuclear fuel and extracting plutonium and uranium. The materials were then shipped to DOE nuclear sites to use in manufacturing atomic weapons and fuel for nuclear-powered Navy ships.

Rockwell has been the target of withering accusations and bad publicity since disclosure in May of a DOE report acknowledging that chemical and radioactive contamination exists in the DOE portion of Santa Susana. The pollution has been described as mostly low-level, but the disclosure greatly increased scrutiny of the nuclear site and made many residents more aware of it.

Rockwell plans to cease all Simi Hills nuclear work

By TONY KNIGHT
Daily News Staff Writer

Rockwell International will end its 40-year nuclear era at the Santa Susana Field Laboratory in the Simi Hills and completely decommission all facilities for handling radioactive materials, a company official said Saturday.

Officials of the company's Rocketdyne Division, which operates Santa Susana, will meet Monday to formulate plans to permanently cease nuclear operations at the mountain laboratory three miles west of Chatsworth, field spokesman [illegible] Coulter said.

"Our intent is to do no more nuclear work at Santa Susana," Coulter said. "We're going to clean it up, return the area to [illegible] condition and make the facilities capable of being released for unrestricted use."

In a written statement released Friday, Rocketdyne's new president, Bob Paster, announced the company will withdraw its Nuclear Regulatory Commission application for a 10-year license renewal for its "hot lab" — a

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heavily shielded workshop for handling radioactive materials.

Paster cited growing public concern over the proximity of the nuclear facility to the heavily populated San Fernando and Simi valleys as the main reason the company decided to close the hot lab within a year if the NRC extended its license until Oct. 20, 1990.

Rocketdyne had operated Santa Susana with only sporadic criticism over four decades until the Daily News reported May 14 that a U.S. Department of Energy survey had found radioactive and chemical contamination in the soil and ground water beneath the facility. The DOE survey said there was no immediate threat to public health but that more tests were needed because monitoring of contamination had been inadequate.

In a series of follow-up investigative articles, the Daily News disclosed that state and federal health and environmental officials were unaware of the extent of the contamination at Santa Susana and had done little independent monitoring.

Rocketdyne's statement Friday had left in question whether the company planned to end nuclear operations on the entire 290-acre nuclear reservation. Besides the hot lab, Rocketdyne operates a complex of more than a dozen buildings under the control of the U.S. Department of Energy and not subject to the NRC.

In the past, Rocketdyne and DOE officials had said they did not know whether nuclear research at the facility would continue in the future, although they promised that all contamination problems would be cleaned up.

In an interview Saturday, Coulter said the company would continue research into rocket propulsion systems on the portions of the 2,668-acre field laboratory that are controlled by the National Aeronautics and Space Administration and the U.S. Air Force.

"We're delighted if it means that they're going to get out of the nuclear business in this highly populated [illegible] intervened in the hot lab relicensing process. [illegible]

Cleanup of the nuclear facilities at the site will continue as scheduled, company officials said. The DOE has prepared a $45.5 million plan to clean up most of the facilities over the next five years. But ultimately the cleanup could take years longer, officials said.

Lit said regardless of what happens with the licensing case, local citizens would continue to keep tabs on cleanup operations to ensure that they are completed as soon as possible and that no new nuclear work is contemplated at the site.

"We need more local people and our local regulatory agencies in charge of oversight," Lit said. "We just want to make sure that they aren't back in business a year later."

News that the company has given up seeking a license renewal for the hot lab was a clear victory for the intervenors, three average citizens who had succeeded in getting the NRC to grant them legal privileges to oppose the company in formal proceedings conducted by an NRC administrative law judge. [illegible]

Lit, Jerome Raskin of Northridge and Jon Scott of Bell Canyon were granted intervenor status last month, and had been preparing for a long and complicated proceeding that would last at least 10 months.

"I think there were a lot of people who said we didn't have a chance," Scott said. "But I thought we did have a chance. I was definitely prepared to go all the way. I'm thrilled that this has happened, because in my mind any time you can stop plutonium and uranium from possibly affecting the entire San Fernando Valley, that's a victory."

NRC officials said the intervenors' case would remain in effect until the company files an amendment to it's license renewal application and Judge Peter B. Bloch has a chance to review it.

"It's up to the judge as to what to do," said Greg Cook, spokesman for the NRC regional office in Walnut Creek. "There will be some discussion with the parties even if it [illegible]

[illegible] small nuclear reactors in the field laboratory from the early 1950s to the mid-'60s. Most of the facilities had fallen into disuse in the past 15 years and the company and the DOE were in the process of slowly decommissioning certain facilities.

Since disclosure last May of the DOE survey at Santa Susana, the U.S. Environmental Protection Agency has assumed oversight of the cleanup at the urging of Rep. Elton Gallegly, R-Simi Valley.

State regulatory agencies also began aggressive investigations into contamination problems in the nuclear area. [illegible]

Pressure from the state mounted last week when Assemblyman Terry Friedman, D-Sherman Oaks, conducted a hearing in Van Nuys on nuclear operations at the site and called for tougher state regulations governing such facilities.

Assemblyman Richard Katz, D-Sepulveda, called on state Health Department Director Ken Kizer to begin an investigation into the health of past and present Rockwell workers and asked Gov. George Deukmejian to formally intervene in the hot lab relicensing proceeding. [illegible]

The hot lab, a heavily shielded workshop where irradiated nuclear fuel can be dismantled and processed into reusable radioactive materials, is the only NRC-licensed facility at the field laboratory.

Most of the nuclear reservation is controlled by the DOE and not under NRC jurisdiction. Eleven buildings where DOE research was conducted have been decontaminated and released for unrestricted use.

But the company and the DOE plan to decommission six additional buildings currently not in use. And plans are underway to decommission the hot lab and a nine-building nuclear waste disposal and packaging complex where extensive soil contamination problems have been identified.

In addition, a DOE environmental survey found soil contamination problems at a Sodium Burn-Pit where waste chemicals and radioactive material were disposed of in the 1960s.

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In the past, Rocketdyne and DOE officials had said they did not know whether nuclear research at the facility would continue in the future, although they promised that all contamination problems would be cleaned up.

In an interview Saturday, Coulter said the company would continue research into rocket propulsion systems on the portions of the 2,668-acre field laboratory that are controlled by the National Aeronautics and Space Administration and the U.S. Air Force.

"We're delighted if it means that they're going to get out of the nuclear business in this highly populated area," said Northridge resident Estelle Lit, one of three San Fernando Valley residents who had formally asked [illegible] to the hot lab relicensing.

Cleanup of the nuclear facilities at the site will continue as scheduled, company officials said. The DOE has prepared a $93.5 million plan to clean up most of the facilities over the next five years. But ultimately the cleanup could take years longer, officials said.

Lit said regardless of what happens with the licensing case, local citizens would continue to keep tabs on cleanup operations to ensure that they are completed as soon as possible and that no new nuclear work is contemplated at the site.

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Now that the company has given up seeking a license renewal for the hot lab, a clear victory for the intervenors, three average citizens who had succeeded in getting the NRC to grant them legal privileges to oppose the company in formal proceedings conducted by an NRC administrative judge.

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"It's up to the judge as to what to do," said Greg Cook, spokesman for the NRC regional office in Walnut Creek. "There will be some discussion with the parties even if it seems there is no reason for continuing the case."

The company operated up to 16 small nuclear reactors at the field laboratory from the early 1950s to the mid-70s. Most of the facilities had fallen into disuse in the past 15 years and the company and the DOE were in the process of slowly decommissioning certain facilities.

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In addition, a DOE environmental survey found soil contamination problems at a Sodium Burn Pit where waste chemicals and radioactive material were disposed of in the 1960s.

The company also plans to clean up six areas discovered during a complete radiological survey.