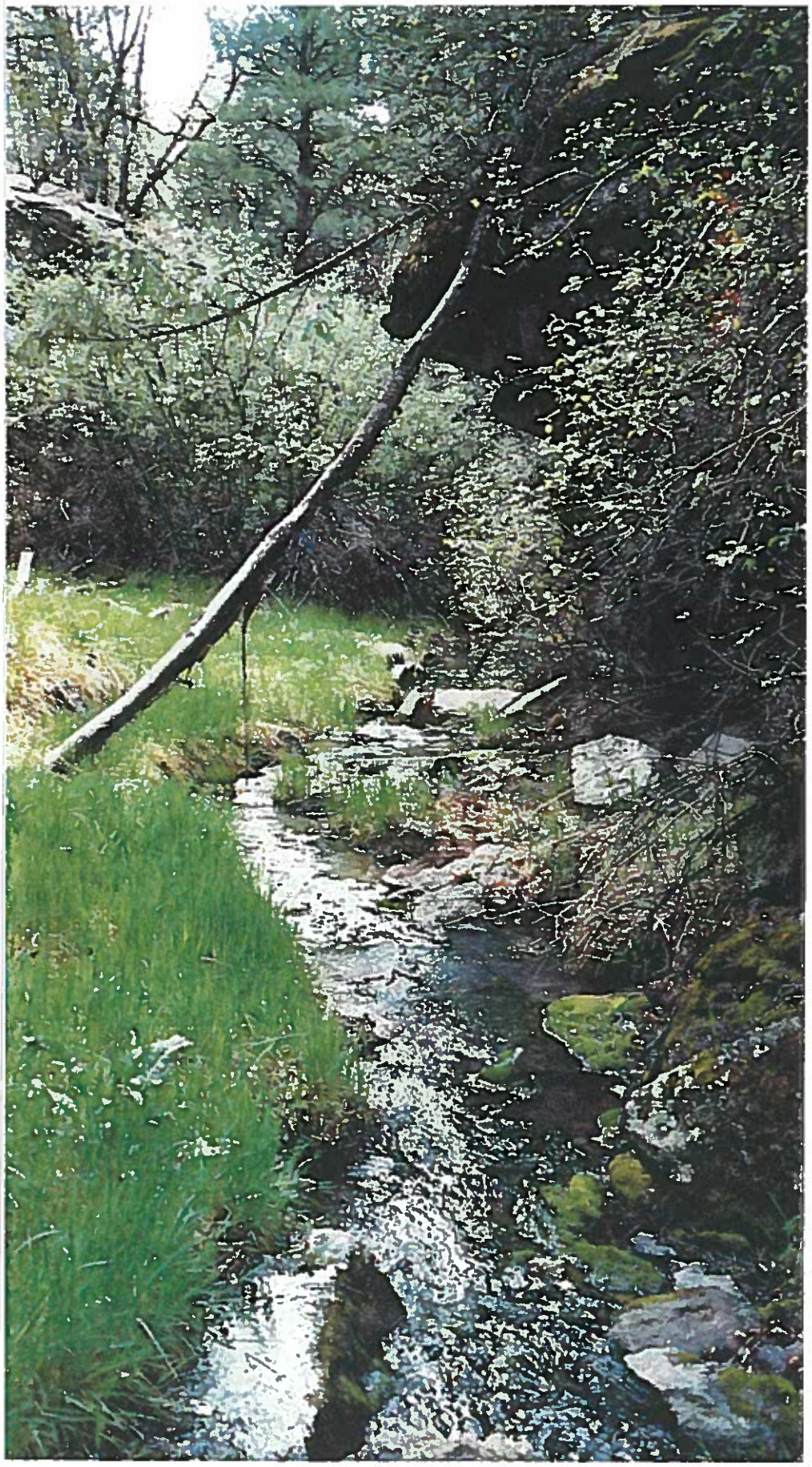

Starmer Gulch, Tributary to Pajarito Creek

Photo by Michael Dale

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New Mexico Environment Department

Environmental Oversight and Monitoring at Department of Energy Facilities in New Mexico

1995 Annual Performance Report

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1995 Annual Performance Report

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EXECUTIVE SUMMARY

INTRODUCTION AND GENERAL INFORMATION

In New Mexico, the DOE Oversight Program's goal to help assure that activities at DOE facilities are protective of the public health and safety and the environment, is pursued through an agreement between the DOE and the State of New Mexico called the Agreement-In-Principle (AIP). This five-year agreement was renewed on October 1, 1995.

ENVIRONMENTAL MONITORING, RESTORATION AND OVERSIGHT

In 1995, the Agreement-In-Principle program worked with DOE and the Laboratories to achieve greater standardization and more timely and cost-effective implementation of plans for environmental restoration at the DOE facilities. A Document of Understanding was entered into by the DOE, the U.S. EPA, the Laboratories, and the New Mexico Environment Department to help facilitate a programmatic approach for implementation of environmental restoration programs at the DOE facilities.

AIP staff conducted environmental monitoring through field surveys, split and independent sampling and measuring field parameters. The scope of environmental surveillance at the DOE facilities spans both on and off-site investigations of environmental media for verification of the facilities' data and background parameters. AIP staff scheduled most split sampling activities with the facilities' staff. Field investigations and sample collections were conducted after which, all sampling data were entered into databases for final submittal to the DOE and the New Mexico Environment Department, before being made available to neighboring tribes, and other concerned stakeholders.

Air sampling was conducted at Los Alamos and Sandia National Laboratories with on-site ambient air samplers that were analyzed quarterly for particulate radionuclides. Additionally, co-located New Mexico Environment Department and facility owned thermoluminescent dosimeters were used to assess background baselines and any facility-related radiation anomalies. This data is also used to verify predictive modeling of doses to surrounding communities.

Surface and ground-water sampling was conducted at designated environmental surveillance sites and outfalls listed on the National Pollution Discharge Elimination System permit for Los Alamos National Laboratory. Additionally, snow and storm water samples were collected at drainages near Los Alamos National Laboratory which transmit surface waters off the site. Sediment and biological sampling and reconnaissance were conducted seasonally.

More efficient tracking and reviewing of field activities and documents, improved data collection and database entry, and better coordination with the DOE and the

Laboratory's environmental field project leaders was experienced in 1995 at Los Alamos National Laboratory.

AIP staff reviewed various site assessment documents including site-wide environmental studies, RCRA facility investigation work plans, expedited cleanups, voluntary corrective actions, proposals for no further action, and sample and analysis plans and provided their comments and recommendations to New Mexico Environmental Department regulators, the DOE and the facilities. These recommendations and comments are meant to assist DOE facilities in their compliance with New Mexico Water Quality Control Commission and other environmental regulations and guidelines. Sometimes, AIP staff advised the DOE to put in place and maintain best management practices to reduce negative impacts to the environment until they achieve final remediation of potential release sites.

The timely release of data by the DOE facilities continues to be an issue of concern for AIP staff.

MONITORING OF DOE COMPLIANCE ACTIVITIES

AIP staff have worked with Los Alamos National Laboratory's staff to make them aware of all state environmental regulatory provisions that apply to the Laboratory's activities, and have recommended interim measures to reduce the migration of contaminants from the Laboratory property until full remediation can be achieved.

Some ground-water samples taken from monitor wells at Sandia National Laboratories and the Inhalation Toxicology Research Institute exceed state standards for certain contaminants including trichloroethylene, nitrates, total dissolved solids, chlorides and sulfates.

AIP staff provided comments to the DOE and the U.S. EPA on the Draft Compliance Certification Application for the Waste Isolation Pilot Plant.

EMERGENCY RESPONSE PLANNING

AIP staff at the DOE facilities continue to participate in facility emergency preparedness exercises. The contract with the N.M. Department of Public Safety did not fulfill objectives of the Agreement-In-Principle, and uncertainties over the objectives in the new agreement and funding levels postponed action in this area.

PUBLIC INFORMATION/PUBLIC RELATIONS

AIP staff increased efforts to improve public knowledge of oversight, monitoring, and environmental issues involving the facilities. Initiatives included distribution of informational pamphlets, newsletters, press releases and site visits. Quarterly and annual reports prepared for the DOE were made available to the public along with

eleven technical reports produced under the AIP program, two which were released in 1995. AIP staff either hosted or attended public meetings focused on environmental oversight and monitoring issues regarding the DOE facilities. A speakers bureau, which includes an educational outreach component was initiated.

TRAINING

AIP staff attended workshops, seminars and classes that either enhanced their technical skills, or were occupational requirements.

1 INTRODUCTION AND GENERAL INFORMATION

1.1 Introduction

The U. S. Department of Energy Oversight Program's goal is to help assure that activities at DOE facilities are protective of the public health and safety and the environment. To pursue this goal, the DOE entered several agreements, collectively known as the Agreements-In-Principle (AIP) with various states. In New Mexico this agreement focused on state oversight of environmental impacts of the four DOE facilities: Sandia National Laboratories and the Inhalation Toxicology Research Institute in Albuquerque, Los Alamos National Laboratory in Los Alamos and the Waste Isolation Pilot Plant in Carlsbad. The New Mexico Environment Department is the State's designated lead agency for the purposes of this agreement.

1.2 Agreement and Grant Negotiations

1.2.1 History

On June 27, 1989, the Secretary of Energy announced a 10-point initiative that addressed the need for the DOE to improve its accountability concerning public health, safety and environmental protection by allowing states hosting the DOE facilities direct access to those facilities and by financially underwriting the costs of state oversight of DOE environmental monitoring programs.

To set up this program in New Mexico the first Agreement-In-Principle was effective from October 22, 1990 through September 30, 1995. Throughout this period the results of Agreement-In-Principle oversight and monitoring activities have been published and made available to the public along with numerous documents transmitting technical comments and concerns relative to specific program areas. These reports and documents serve as a source of reliable technical information for the writers of facility proposals and decision makers at regulatory agencies.

1.2.2 Current Agreement

The DOE has granted the State of New Mexico funds over the five-year period commencing October 1, 1995 to continue to carry out its responsibilities under the Agreement-In-Principle. There are four primary objectives of the program:

* To assess the DOE's compliance with existing laws including regulations, rules, and standards.

* To participate in DOE's prioritization of cleanup and compliance activities.

* Develop and implement a vigorous program of independent monitoring and oversight.

* To communicate with the public to increase public knowledge of environmental matters about the facilities, including coordination with local and tribal governments.

1.3 Umbrella Protocol - New Mexico Environment Department/DOE

To provide general guidance for both New Mexico Environment Department and U. S. Department of Energy personnel involved in the AIP program the "Guidance Protocol for Implementation of the Environmental Oversight, Monitoring and Remediation Agreement at Department of Energy Facilities in New Mexico" was developed and distributed to all staff in July 1992.

As required by the Agreement-In-Principle, a new Umbrella Protocol was drafted by AIP staff and submitted to the U.S. Department of Energy in December 1995. This document in its final form will provide guidance to U.S. Department of Energy area offices and the New Mexico Environment Department for establishing procedures and guidelines for the AIP-related day-to-day operations between the DOE, DOE contractors and the State of New Mexico.

1.3.1 Site Specific Protocols

Upon final approval of the Umbrella Protocol, site specific protocols will be developed by each site that will describe the procedures for the AIP related day-to-day activities and interactions at the DOE facilities. Specific details will be provided on management and transfer of documents and information, meetings, public affairs, reporting, roles of site representatives, security and training.

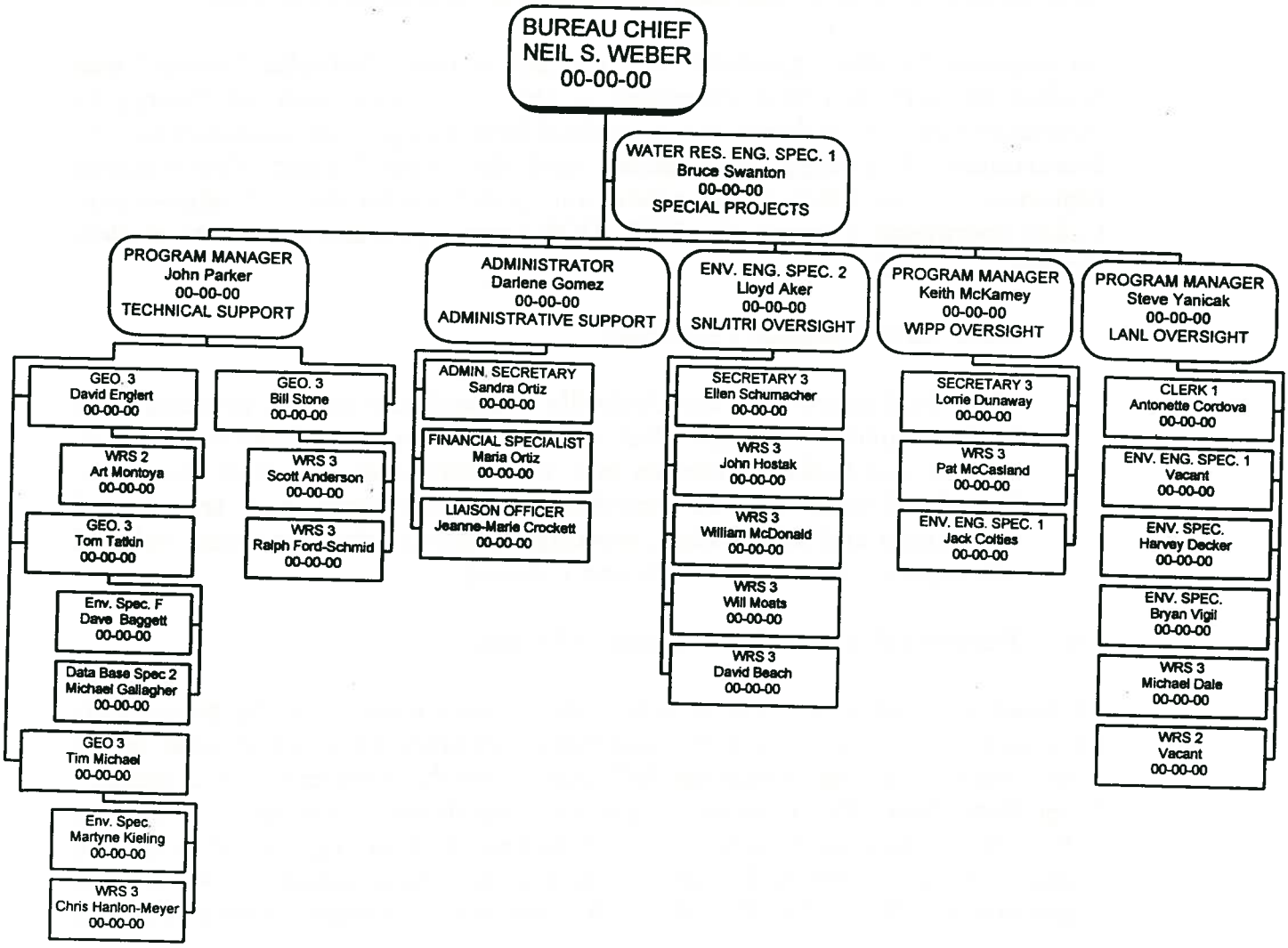
1.4 Personnel and Administrative Issues

To meet the State of New Mexico's obligations under the Agreement-In-Principle, The New Mexico Environment Department hired a total of 35 employees to fill positions that are fully funded by the Agreement-In-Principle. These New Mexico Environment Department employees, collectively known as AIP staff are located on-site at the Department of Energy facilities in Los Alamos, Albuquerque and Carlsbad and at the New Mexico Environment Department in Santa Fe. The AIP staff perform environmental oversight and

monitoring at the four facilities.

In 1995, the AIP staff members were organized into a single Bureau (see Figure 1). This structure has significantly improved communications among AIP staff, DOE staff, DOE contractors and the public, allowing for a more cooperative working relationship that facilitates the goal of achieving voluntary compliance with applicable environmental rules and regulations. The new organizational structure resulted in clear lines of authority that increased internal accountability and enhanced the ability of the AIP staff to pursue priorities and work objectives under the agreement.

Figure 1
DOE Oversight (AIP) Bureau



Four additional security clearances (Q clearances) were issued to AIP staff members during 1995. On December 31, 1995, no clearances for staff members were in process and seven staff members had yet to apply for clearances.

The State of New Mexico was provided vehicles for use by the AIP staff in their monitoring and oversight activities. Twelve vehicles were leased by the New Mexico Environment Department from the General Services Administration Fleet Management Center in Albuquerque. These vehicles are stationed at the Waste Isolation Pilot Plant, Los Alamos National Laboratory, Sandia National Laboratories and Inhalation Toxicology Research and New Mexico Environment Department in Santa Fe.

1.5 Workplan

The Agreement-In-Principle requires that the State of New Mexico prepare a plan for its independent oversight of programs for monitoring the environment at and near the DOE facilities and for assessing compliance with applicable environmental laws and regulations. Additionally, the State of New Mexico must provide this plan to the DOE, the U. S. Environmental Protection Agency, other appropriate federal and state agencies, and affected local and tribal governments for review and consultation. A draft of the Umbrella Workplan for the period October 1, 1995 through September 30, 2000 was submitted to the DOE in December 1995.

2 ENVIRONMENTAL MONITORING, RESTORATION AND OVERSIGHT

2.1 General

Implementation of the Agreement-In-Principle program at the facilities was accomplished under the new organizational structure using a project management approach. Each oversight program area had a designated project team leader at the site who would designate a task leader to pursue a specific task. Teams frequently included members who reported to different line managers.

Several technical guidance documents were developed for the environmental restoration oversight program during 1995. "A Guide to the Review of Environmental Restoration Documents" provides an excellent primer for technical staff new to this program area. The "Draft Guidance for the Evaluation of NFA Proposals" provides criteria used to review proposals for no further action by the environmental restoration programs at the sites.

AIP staff participated in a series of meetings with key staff from the U.S. Department of Energy, Sandia National Laboratories, Los Alamos National

Laboratory, the U.S. Environmental Protection Agency, and the New Mexico Environment Department Hazardous and Radioactive Materials Bureau. The meetings resulted in the development of a "Document of Understanding" which is meant to facilitate the timely and cost-effective implementation of the environmental restoration programs at Sandia and Los Alamos National Laboratories.

2.2 Los Alamos National Laboratory Oversight

Los Alamos National Laboratory Oversight was conducted by AIP staff members located in White Rock and in Santa Fe. Oversight activities include environmental field surveys and sampling, site visits, and document reviews that are mainly associated with the Laboratory's Environmental Surveillance, Environmental Restoration and Waste Management Programs.

2.2.1 General Oversight Activities

The reorganization of AIP staff resulted in a more efficient data collection, tracking, and data base entry system that has expedited data submittal to the DOE and state regulatory agencies. The improved data tracking system will enable AIP staff to submit all 1994 and 1995 surface and ground water data to the DOE during the first quarter of 1996.

AIP staff reviewed and commented on the classified and non-classified Draft Environmental Impact Statement for the Dual Axis Radiographic Hydrodynamic Test Facility. Of the alternatives presented in the environmental impact statement, AIP staff recommend adoption of the "Enhanced Containment Alternative," which would minimize impacts on surface water and ground-water systems, air emissions, and local ecological systems including threatened and endangered species.

AIP staff reviewed the Laboratory's "Geologic and Hydrologic Records of Observation Wells, Test Holes, Test Wells, Supply Wells, Springs, and Surface Water Stations in the Los Alamos Area" which is an up-to-date account of all geologic and hydrologic records at the Laboratory.

AIP staff reviewed and commented on the non-classified Draft Environmental Impact Statement for the Relocation of the Neutron Test Target Tube Facility to a different location at the Laboratory. Comments addressed the Neutron Test Target Tube Facility's impact on surface or ground-water systems, air emissions, and local ecological systems including threatened and endangered species.

AIP staff performed 11 verification inspections of spills and submitted recommendations on spill closures to the New Mexico Environment

Department regulators.

2.2.2 Environmental Surveillance

To reduce program costs, AIP staff initiated a more cost effective water and sediment sampling approach for hundreds of low-priority sites. This approach, which used an archival and statistical justification for determining where samples are collected, and how many parameters and samples are analyzed, reduced the duplication of efforts by AIP staff and the Laboratory. Independent, background, and certain verification sampling were still conducted on a case by case basis. In summary, the objectives of verifying air, water, and sediment sampling data, independent environmental monitoring, and verifying and/or establishing background parameters were not compromised.

2.2.2.1 Ground Water

A longstanding contention of the AIP staff has been that the Laboratory's ground water monitoring program and underlying knowledge of the hydrogeology of the Pajarito Plateau are inadequate. In response to this concern, the Laboratory developed a Draft Ground Water Protection Management Program Plan and AIP staff participated in ongoing technical meetings concerning the plan. This site-wide hydrogeologic characterization and monitoring plan represents the first effort by the Laboratory to synthesize information from many different research programs and provide information needed to support decisions that will be required in the Environmental Restoration project. Although this is a long term, resource intensive program, it should pay dividends down the road.

Another longstanding concern of the AIP program has been the Laboratory's failure to conduct timely investigation of potential ground water contamination following the detection of an elevated contaminant. AIP staff made recommendations to the DOE that the Laboratory takes quarterly samples from three test wells in Los Alamos, Mortandad and Acid Canyons following the Laboratory's and AIP staff's preliminary indications of elevated Strontium-90 in samples taken from two of these test wells during 1994. AIP staff participated in purge tests of the three test wells to assess the possibility of Strontium-90 contamination having resulted from shallow or surface contamination migrating down the well bore. The data showed no Strontium-90 but was inconclusive regarding the integrity of the well.

Effluent from the Laboratory's liquid radioactive waste treatment facility is discharged into Mortandad Canyon, where it joins surface runoff or soaks into the stream deposits on the canyon floor. To investigate the fate of this discharge, AIP staff modeled the perched ground-water system in Mortandad Canyon. With evapotranspiration maximized and neither ground-water underflow nor leakage to the tuff allowed, the model showed that the stream flowed the entire length of the canyon. As this normally does not occur, the water shown by the model to be leaving the system via streamflow must be dispersed by downward leakage. While this preliminary model showed the need for additional data on various parameters, it confirmed results of previous studies and modeling: leakage through the tuff is occurring.

AIP staff collected 14 ground-water spring samples during two White Rock Canyon environmental surveillance trips. AIP staff measured field parameters on all 21 previously documented springs along the west side of the Rio Grande in White Rock Canyon. These springs are surface expressions of ground water occurring beneath the Pajarito Plateau where Los Alamos National Laboratory is conducting its testing and research. Parameters measured were consistent with regional background levels.

2.2.2.2 Surface Water

A primary concern of the AIP staff is the lack of adequate studies or data regarding radioactive and hazardous contaminants leaving the Laboratory property during snowmelt and storm water events. To assess this concern, portable storm water samplers were deployed to monitor and collect surface water samples from summer storm events. The samplers were located in Los Alamos Canyon, Pueblo Canyon, and Canada del Buey. Additionally, samples were taken of storm water and snow-melt runoff in Los Alamos, Mortandad, Water, Potrillo, Cañada del Buey, Ancho, Pajarito, and Pueblo Canyons, and on San Ildefonso Pueblo property. Preliminary review of data derived from these activities indicates that some radiological and non-radiological contaminants are leaving the laboratory property.

Preliminary data collected by AIP staff show elevated levels of mercury and uranium in storm water runoff from Hillside 138, a potential release site within Los Alamos Canyon. AIP staff have recommended application of best management practices, as an interim measure, to reduce the movement of contaminants from

the site until final remediation is accomplished. A voluntary corrective action to address plutonium contamination has been delayed pending further assessment for mercury and uranium as recommended by AIP staff.

An additional surface water concern AIP staff pursued at the Laboratory was the fate of the outfall effluent from the radioactive liquid waste treatment facility at TA-50 that discharges into Mortandad Canyon. The elevated nitrate and radionuclide effluent initially affects the surface water quality of the canyon, but it is ultimately a ground-water concern due to the impacts on the shallow alluvial aquifer and perhaps deeper ground-water systems within the Canyon. A model of the perched water system in Mortandad Canyon was discussed in the Los Alamos National Laboratory, Environmental Surveillance, Ground Water section of this report.

AIP staff submitted all 1994 - 1995 data on sediment sampling from the Mortandad Canyon sediment trap and recommended to the DOE and the Laboratory that their sampling methodology should selectively sample the fine-grained fraction of sediments that has been shown to contain most of the radionuclide contaminants.

To address the lack of a background water chemistry baseline, AIP staff conducted field reconnaissance leading to the discovery of new springs in Pajarito, Canon de Valle, Threemile and Water Canyon. The four new springs were investigated for discharge flow and baseline water quality. The data on these springs contributed to the updating of Los Alamos National Laboratory's spring location maps. AIP staff recommended that the perennial watershed reaches and associated springs be characterized.

AIP staff participated in meetings and made technical recommendations concerning the application of best available technologies at the Laboratory's Radioactive Liquid Waste Treatment Facility. These meetings and recent violations of the U. S. Environmental Protection Agency's national pollutant discharge elimination system involving pH fluctuations of nitrates and radionuclides prompted the Laboratory to evaluate new technologies to address the inadequacy of the 30-year-old facility to treat tritium, strontium, plutonium, americium, cesium and nitrates.

A Wetlands Working Group was established by AIP staff with staff

members from both the DOE, and the Laboratory to address the degraded condition of Sandia Canyon near the Los Alamos County Landfill.

AIP staff conducted oversight split sampling of approximately 90 sites including springs, wells, surface water, and sediments during the seasonal environmental surveillance activities.

AIP staff met with GRAM and Associates to discuss submittal of 1990 - 1995 environmental monitoring data. GRAM and Associates is the chief contractor for DOE in preparation of the site-wide environmental impact statement.

The recommendations and information provided to the DOE as a result of NMED's sampling of effluent and surface water contributed to a reduction in NPDES listed outfalls from 144 in July 1993 to 97 in December 1995.

2.2.2.3 Sediments/Foodstuffs

AIP staff obtained split samples from twenty of the eighty-three sediment surveillance locations. They also obtained split samples from eight of the twenty-three soil surveillance locations. Analytical parameters were selected in consultation with the Laboratory staff to provide a basis for statistical verification of the Laboratory's data once they become available. Data compiled by AIP staff show concentrations in soils and sediments were below screening action levels yet some analytes exceeded background.

The garden plots maintained by the Laboratory for foodstuff sampling were not productive enough in 1995 to provide split samples for the AIP program. Samples were taken from wild fruit trees (apple and crabapple) on Laboratory property and wild spinach from San Ildefonso Pueblo property. Analytical results from these samples are pending.

2.2.2.4 Air Monitoring

As part of a cooperative initiative with the Laboratory, five "real time" air radiation monitors were deployed as part of the Neighborhood Environmental Watch Network system known as NEWNET. Monitors were deployed at the Community Health Program Office in El Rito, Northern New Mexico Community College in Espanola, San Ildefonso Pueblo, Santa Fe Prep High School, and Cochiti Pueblo. Data from these stations and others

are accessible over the Internet.

A new company was selected to provide thermoluminescent dosimeter chips for the environmental radiation network to eliminate the problems associated with the use of the aluminum oxide chips provided by Landauer, Incorporated. Landauer's chips were specifically developed to measure the low levels of radiation necessary for environmental radiation dosimetry. However the chips consistently measured lower levels of radiation than the established background levels for the region. After a transition period when two sets of chips at each of the eleven monitoring stations will be deployed, Landauer's chips will no longer be used.

AIP staff conducted regular maintenance and collection of air particulate filters from four monitoring stations co-located with air monitors established by the Laboratory. Four new air particulate monitors were purchased and will replace some of the existing monitors. Use of the old monitors is being considered for co-location with air monitors established by the Laboratory at additional locations. The new monitors will simplify data comparisons with the Laboratory as they are the same type of monitor that the Laboratory uses.

2.2.3 Environmental Restoration

The 1994 reorganization of the DOE's corrective action program at Los Alamos National Laboratory resulted with the twenty-four former operable units being reclassified into six field units. Oversight responsibilities for these field units and their associated activities were distributed among eight AIP staff members. Reorganization of both the Laboratory's Environmental Restoration Project staff and AIP staff resulted in more efficient tracking and reviewing of field unit activities and documents, improved data collection and database entry, and better coordination with the DOE and the Laboratory's environmental field project leaders.

Oversight activities with the environmental restoration project included technical reviews of site assessment documents including site-wide environmental studies, RCRA facility investigation work plans, expedited cleanups, voluntary corrective actions, and proposals for no further action. In some cases, staff provided preliminary evaluations of compliance with federal and state regulations. In addition, split and independent sampling was conducted at a number of environmental restoration sites to verify cleanup activities.

To review the two thousand or more potential release sites effectively, AIP staff utilized a site ranking system. The prioritization criteria were based on the Laboratory's site ranking system and modified by AIP staff to allow for consideration of additional surface and ground-water concerns at potential release sites.

AIP staff worked with the DOE and the Laboratory's environmental restoration project staff and New Mexico Environment Department regulators to assure compliance with New Mexico Water Quality Control Commission guidelines. AIP staff have alerted the DOE that all potential release sites in watercourses should be assessed for potential mobilization and transport of contaminants by storm water. AIP staff have advised the DOE that they should put in place and maintain best management practices until they accomplish final remediation of potential release sites. A watershed approach has been recommended to assess cumulative effects of multiple potential release sites in each canyon on surface water quality. Watershed maps that delineate potential release sites in watercourses have been requested. Documentation of constituents of concern present, and the concentrations found at each site has also been requested.

Comments and recommendations provided by AIP staff at meetings with the six field unit groups were used to help assess and prioritize potential release sites at the Laboratory. Risk and environmental concerns as determined by the DOE, the Laboratory, the U. S. Environmental Protection Agency, the New Mexico Environment Department, and stakeholders were used to set the criteria for prioritization.

AIP staff observed deactivation and decontamination activities at TA-21, the old plutonium processing site, and participated in discussions with the DOE and the Laboratory's waste management staffs regarding a water line break. Approximately 130,000 gallons were thought to have been discharged. The line was located under a section of the excavated facility that was historically used for enriched uranium and plutonium processing. Possible radionuclide contamination of adjacent drainages and watercourses may have resulted from the break. The DOE, and the Laboratory used comments and recommendations from AIP staff to help assess the regulatory concerns of the New Mexico Environment Department.

AIP staff reviewed and provided comments to New Mexico Environment Department regulators, the DOE and the Laboratory on various documents, plans and activities. Staff reviewed field unit environmental restoration documents including a voluntary corrective action plan for the former asphalt batch plant and expedited cleanup plans for sites at

Technical Areas 3, 6, 8, 9, 18, 22, 33, 36, 39 and 48. They also reviewed various sample and analysis plans. At a number of locations staff provided comments regarding the application of best management practices for surface water runoff controls, and comments regarding the installation and location of ground water monitoring wells.

AIP staff have been involved in the review and evaluation of proposals for no further action at 148 solid waste management units and 428 areas of concern.

2.2.4 Waste Management

As a means of orienting new staff working in this program area, primary facilities involved with the generation, treatment or storage of wastes at Los Alamos National Laboratory were visited. These include the plutonium processing facility (TA-55), the radiological liquid waste treatment facility (TA-50), and the low-level radioactive waste disposal and chemical and mixed waste storage facilities at TA-54. In addition, programs that direct or influence waste management practices at the Laboratory were reviewed in order to understand policy implementation.

National Environmental Policy Act documents which involve activities at the Laboratory which generate wastes were reviewed such as the Dual Axis Hydrodynamic Radiographic Testing facility Environmental Impact Statement. Staff recommended the enhanced containment alternative in order to minimize the level of wastes entering the environment from this activity.

In meetings with the DOE and the Laboratory's waste management staff, AIP staff raised concerns regarding questionable management practices resulting in two potable water line breaks at the low-level radioactive waste storage facility at TA-54. A total of approximately 500,000 gallons is thought to have been discharged. AIP staff sampled the resulting liquids and detected no radioactive contaminants. The DOE and the Laboratory used comments and recommendations from AIP staff to help assess potential regulatory concerns of the New Mexico Environment Department.

AIP staff reviewed the Defense Nuclear Facility Safety Board's technical report addressing the overview of ventilation systems at selected DOE plutonium processing and handling facilities. Staff noted substantial findings by the board regarding the Laboratory's plutonium processing and chemical and materials research buildings and are following up on the Laboratory's response to the report.

2.3 Sandia National Laboratories/Inhalation Toxicology Research Institute Oversight

2.3.1 General Oversight Activities

AIP Staff completed Phase II of the Inhalation Toxicology Research Institute Monitor Well Drilling Project, by drilling four bore holes, near the facility and installing three ground-water monitoring wells, two on Isleta Pueblo land and one on Kirtland Air Force Base. This activity was undertaken to learn if ground-water contamination from the facility's lagoons was migrating off-site to Isleta Pueblo land. An analysis of the resulting data shows that the facility's hydrogeologic model may need revision, however, sampling results have not shown contamination above New Mexico Water Quality Control Commission Standards for ground water.

AIP staff reviewed and provided comments on the Sandia National Laboratories' Medical Isotope Environmental Impact Statement Implementation Plan, the Environmental Assessment for the Processing and Environmental Technology Laboratory at Sandia National Laboratories, New Mexico, and the Low-Level Waste Transportation Environmental Assessment Document for relocation and construction of the Sandia National Laboratory's High Intensity Gamma Irradiation Facility at Technical Area V.

The Resource Conservation and Recovery Act's Hazardous and Solid Waste Amendments of 1984 corrective action process requires that Sandia National Laboratories issue an annual summary of the current knowledge of the installation-wide hydrogeological environment. The summary is called the Site-wide Hydrogeologic Characterization Report. This report was reviewed by AIP staff and they submitted their comments to the facility and to the U.S. Environmental Protection Agency. The comments stated that the annual summary did not provide adequate information to relate sources of contamination to pathways and rates of migration, as determined by local and regional hydraulic gradients and aquifer characteristics.

Staff completed a report titled "Background Ground Water Quality of Kirtland Air Force Base Area, Bernalillo County, New Mexico," which provides an independent assessment of background concentrations of ground-water constituents on Kirtland Air Force Base, which the Laboratory is a tenant.

2.3.2 Environmental Surveillance

AIP staff continue to collect low volume ambient particulate samples and maintain an ambient thermoluminescent dosimetry network. The results of these studies of the Kirtland Air Force Base area background radiation levels were released in reports titled *Characterization of Environmental Radiation and Radioactivity Near Albuquerque, New Mexico*, and *DOE Oversight Air Monitoring Results*. These reports gave the results of ambient area radiological measurements that can be used to compare background radiation levels with proposed restoration site cleanup levels.

To determine the composition of area rocks, AIP staff completed a study titled "Chromium and Major-Element Compositions of Rocks in the KAFB Area, Bernalillo County, New Mexico."

2.3.3 Environmental Restoration

One objective of the Agreement-In-Principle program at Sandia National Laboratories is to monitor environmental restoration activities at approximately 150 sites. To accomplish this, AIP staff 1) reviewed work and sampling plans to determine if the plans met characterization objectives, 2) monitored the cleanup of sites to verify compliance with cleanup criteria, 3) split environmental samples with the Laboratories to provide independent verification of data, 4) provided technical information to New Mexico Environment Department Resource Conservation and Recovery Act Programs and the U.S. Environmental Protection Agency regarding decisions such as "No Further Action" designation, and 5) evaluated investigation or cleanup decision criteria.

To understand and monitor these activities, staff initiated communications with responsible Laboratory personnel. Staff attended weekly task leader meetings of the organization responsible for landfills and test areas, and met with task or project leaders for specific purposes or to discuss specific issues.

As part of the oversight of environmental restoration activities, staff provided comments to the Laboratories and regulators on site assessment workplans for three areas: Technical Area I, Central Coyote Test Area, and the Foothills Test Area. AIP staff observed sampling and site investigation activities in these areas throughout the year.

AIP staff completed the draft report, "Summary Report of Ground-water Monitoring at Sandia National Laboratories' Liquid Waste Disposal System," which included recommendations concerning additional ground-water monitoring in the disposal system area.

AIP staff investigated a number of sites proposed for no further action and communicated their results to regulators for their consideration. Some sites seemed appropriate candidates for no further action determinations; however, additional investigation was recommended for many of the sites before a decision can be made.

AIP staff participated in the decision process and options analysis conducted by the Corrective Action Management Unit Working Group. The activities of this group were part of an initiative designed by the Laboratories to involve the DOE, oversight staff, regulators, and the public in the process of making decisions regarding the disposal of wastes generated by the environmental restoration project.

Staff reviewed the 1994 Site-Wide Hydrogeologic Characterization Annual Report. Overall the report was found to adequately address the concerns of the Agreement-In-Principle program.

Staff reviewed the draft Sandia National Laboratories Base-wide Background Report and informally communicated comments on the report to the Laboratories' technical staff. A review of the data used for the background study was begun in 1995.

Staff observed the excavation by the Laboratories of a number of soil test pits. They excavated the pits to gather soils' data for site-wide background studies. Soil horizons were recorded and described, and soil samples were collected for archiving.

Staff reviewed the sampling and analysis plan and collected verification samples at the Gas Cylinder Disposal Pit in Technical Area III. This pit was excavated as part of a voluntary corrective measure conducted by the Laboratories. Concentrations of contaminants in the verification samples were below action levels and agreed closely with the Laboratories' results.

Staff observed and monitored investigation and sampling activities at Technical Area V, southwest of a monitoring well where trichloroethylene has been detected. Split samples were collected at selected new monitoring wells. The samples confirmed the Laboratories' results.

Split samples were collected from monitoring wells at the Mixed Waste Landfill; no hazardous constituents were detected.

As part of their data collection efforts, staff prepared summary data packages for use in release of data to the DOE and the public. The data packages are intended for maintenance of data files, and for convenient comparison to the Laboratories' data.

2.3.4 Waste Management

AIP staff inspected the HERMES III Accelerator, including portions of the facility that produce radioactive emissions and the stack monitoring equipment. Inspection results and deficiencies noted in the facility Quality Assurance Plan and the Sampling and Analysis Plan were submitted to DOE and the Laboratories for corrective actions.

2.4 Waste Isolation Pilot Plant Oversight

2.4.1 General Oversight Activities

AIP staff have been concerned with the observed increases in water levels measured in test wells at the site. To investigate the source of the observed increases, AIP staff observed a casing integrity test requested by the New Mexico Oil Conservation Division and conducted by Yates Petroleum. A pressure test was conducted on an injection well located within a mile of the southeast corner of the Land Withdrawal Boundary that is injecting water at a rate of 30,000 to 100,000 barrels of water a month. The results showed that the casing in the well had good integrity. Staff are continuing to investigate this concern.

AIP staff participated in a symposium on the "Potential Effects of Oil and Gas on WIPP." The purpose of this meeting was to evaluate potentially adverse effects of oil and gas drilling and production on the Waste Isolation Pilot Plant. AIP staff provided the following recommendations to the DOE after the meeting:

1. The integrity of the seals in all wells within the Land Withdrawal Boundary should be measured to evaluate potential pathways for ground-water communication.

2. Directional drilling should be restricted within the Land Withdrawal Boundary.

3. Control zones should be re-instituted to prevent potential effects of drilling wells.

4. The ground-water sampling program should be increased to monitor effects of oil and gas wells on the perimeter of the Land Withdrawal Boundary.

AIP staff provided comments on the proposed U.S. EPA rule: *Criteria for Certification and Determination of the Waste Isolation Pilot Plant's*

Compliance with Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level, and Transuranic Radioactive Wastes (40 CFR 194). The comments focused on technical aspects relating to basin definition, borehole density calculations, and long-term monitoring requirements.

AIP staff provided comments on Revision 1 of the proposed Joint Powers Agreement between the DOE and state agencies dealing with land management issues associated with the project. Comments addressed the need for special conditions requiring periodic tracer studies and notification to the DOE and the New Mexico Environment Department so that hydraulic fracturing fluids, drilling fluids, and ground-water well fluids can be monitored for radiation.

2.4.2 Environmental Surveillance

Results from split or co-located sampling events with the Waste Isolation Pilot Plant were compared with the facility's baseline data. AIP staff analytical suites duplicate those of the DOE to provide data comparisons. Preliminary results from these comparisons show substantial agreement.

Thermoluminescent dosimeters were monitored at the facility throughout 1995 to measure levels of penetrating radiation. These devices are currently used to determine ambient levels of radiation to establish a baseline for future comparisons should the facility begin to receive radioactive waste.

2.4.3 Environmental Restoration

AIP staff observed sampling of the many boreholes in an experimental room within the repository. The six-inch boreholes are legacies of the micro fine grout injection experiment conducted in 1994. One dye used to mark the grout contained trace amounts of a chromium compound. The DOE has sampled boreholes surrounding these grout experiments and will analyze these samples to measure the mobility of organic and inorganic chemical contaminants in the wastes.

AIP staff reviewed the Voluntary Release Assessment/Corrective Action Workplan for Solid Waste Management Units at the Wast Isolation Pilot Plant. They commented that all drilling pits did not contain the same fluids.

3 MONITORING OF DOE COMPLIANCE ACTIVITIES

3.1 Los Alamos National Laboratory

As discussed in the Environmental Restoration section, AIP staff have advised Los Alamos National Laboratory Environmental Restoration Project personnel that additional regulatory drivers apply to the corrective action process than just the Resource Conservation and Recovery Act regulations. AIP staff provided recommendations regarding the use of best management practices to comply with the New Mexico Water Quality Control Commission regulations. The Laboratory has begun to implement best management practices at some environmental restoration sites.

AIP staff also made recommendations regarding the technical requirements of a ground water monitoring program as required by Module VIII of the Hazardous and Solid Waste Amendment permit for the Laboratory. AIP staff have participated in a series of meetings regarding the Laboratory's Ground Water Protection Management Program Plan. The Plan is scheduled for completion by the summer of 1996 and will be implemented starting in 1999.

3.2 Sandia National Laboratories/Inhalation Toxicology Research Institute

Ground water samples from monitor wells at Sandia National Laboratories' Technical Area II exceed State of New Mexico ground-water standards for trichloroethylene and nitrates. State standards for trichloroethylene were exceeded in ground-water samples taken from the old seepage pit area within Technical Area V.

Ground-water samples from monitor wells around the old Inhalation Toxicology Research Institute lagoons exceed State standards for total dissolved solids, chlorides, nitrates and sulfates.

3.3 Waste Isolation Pilot Plant

AIP staff provided comments on the Draft Compliance Certification Application for the U.S. EPA *Environmental Radiation Protection Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Wastes (40 CFR 191).* It was recommended that the application include the following:

1. Address hydraulic fracturing as one of the Features, Events and Processes evaluated to assess long term performance of the

repository.

2. Describe the mineralogy of Marker Bed 138 and 139 in the chapter on Salado.

3. Characterize the Dewey Lake hydrology since it is an aquifer in the area.

4. Characterize P-18 hydrology, if water levels are rising due to bridge plug failure in Cabin Baby #1 as the DOE contends, repair Cabin Baby #1 and monitor the natural ground-water conditions.

5. Include borehole information within the 16-section boundary so that the U.S. Environmental Protection Agency can adequately determine compliance rather than listing the regulations for plugging wells.

6. Include disposal or injection wells in the probability of occurrence.

4 EMERGENCY RESPONSE PLANNING

The New Mexico Department of Public Safety hired an individual to pursue emergency response objectives under an agreement with the New Mexico Environment Department. The individual was in this position for such a short time that nothing tangible was accomplished. The agreement expired at the end of the state fiscal year (June 30) and work on a new agreement was put on hold pending renewal of the Agreement-In-Principle. Uncertainties with the budget level that persisted through the end of 1995 further delayed this activity. The New Mexico Environment Department is currently evaluating whether to pursue oversight objectives in emergency response using in-house expertise.

AIP staff continue to participate in mock site emergency drills to prepare for emergency events.

AIP staff are active in the Eddy County Local Emergency Planning Committee.

AIP staff participated in a Sandia National Laboratories' emergency preparedness exercise including; attending preparatory briefing, acting as a site controller for a full-scale emergency exercise and participating in evaluation briefing. The exercise involved explosive, chemical and radiological hazards, mass casualties, spread of contamination and integrated multi-agency response.

5 PUBLIC INFORMATION/PUBLIC RELATIONS

5.1 General

In 1995, AIP staff increased their efforts to communicate with the public to increase public knowledge of oversight, monitoring, and environmental issues involving the facilities. Initiatives were taken to solicit comments from the public which were incorporated into the development of technical workplans.

An updated general informational pamphlet describing the New Mexico Environment Department DOE Oversight Program was published and distributed to the public in the autumn of 1995. Two issues of the *Environmental Report*, a New Mexico Environment Department Agreement-In-Principle newsletter, were published during the year. The Newsletter focused on technical issues of public interest at each facility.

Information was disseminated through the press regarding Agreement-In-Principle activities such as the placement of the community-based radiation monitor at Santa Fe Prep High School, renewal of the five-year Agreement-In-Principle, the April 13 Alpine Earthquake and biotic sampling near the Waste Isolation Pilot Plant.

AIP staff and DOE Los Alamos Area Office co-hosted a Los Alamos National Laboratory site visit for Lamb & Associates personnel to help familiarize them with environmental oversight concerns at Los Alamos National Laboratory. AIP staff from Los Alamos, Santa Fe and Albuquerque visited the Waste Isolation Pilot Plant in Carlsbad, New Mexico to discuss technological issues concerning proposed radiological waste disposal. The site visit was hosted by the on-site AIP staff and the DOE.

At the Sandia National Laboratory's Earth Day conference, AIP staff responded to questions regarding the AIP program, distributed materials and demonstrated the use of a storm water sampling trailers.

5.2 Reports

5.2.1 Quarterly Reports

The New Mexico Environment Department issued quarterly implementation reports to the DOE describing the scope of work, objectives, accomplishments and significant issues that occurred during each calendar quarter. The quarterly report, which was originally developed as a management tool, is now a requirement under the current Agreement-In-Principle.

5.2.2 Annual Report

As required by the Agreement-In-Principle, the New Mexico Environment Department submits an Annual Performance report for environmental monitoring and oversight at DOE facilities in New Mexico. This document satisfies the requirement for the 1995 Annual Report.

5.2.3 Publication of Findings

The New Mexico Environment Department makes available to the public, technical reports of State findings relating to the quality and effectiveness of the facilities' environmental monitoring and surveillance programs. The following reports were released in 1995:

Preliminary Results of Modeling the Shallow Aquifer, Mortandad Canyon, Los Alamos National Laboratory, New Mexico

Characterization of Environmental Radiation and Radioactivity Near Albuquerque, New Mexico

5.3 Informational Meetings

5.3.1 Public Meetings

To facilitate communication, AIP staff hosted or attended public meetings focused on environmental oversight and monitoring issues regarding the DOE facilities.

AIP staff conducted a public meeting on September 27, 1995 at Loma Linda Community Center about oversight activities at the Sandia National Laboratories and the Inhalation Toxicology Research Institute facilities. AIP staff shared the results of three reports concerning background and radiation issues.

AIP staff organized a booth at the Southeastern New Mexico State Fair to inform the public of New Mexico Environment Department's role in protecting the environment. Over a six-day period more than 100,000 people attended this fair.

Staff routinely attended the DOE and Sandia National Laboratories' Environmental Restoration Quarterly Public meetings, Kirtland Air Force Base Environmental Working Group Quarterly meetings, Kirtland Ground Water Working Group meetings and the City of Albuquerque and Bernalillo County Air Quality Control Board public hearings and board meetings.

AIP staff participated in regular Sandia National Laboratories Public Involvement Working Group meetings, attended monthly meetings of the Citizen Advisory Boards for Sandia National Laboratories and Los Alamos National Laboratory and participated in the Sandia National Laboratories Corrective Action Management Unit Public Working Group meetings.

AIP staff participated in the second "LANL 2000" public conference, and discussed educational outreach programs in a panel format.

AIP staff regularly attended public meetings held by the DOE to solicit comments on National Environmental Policy Act actions.

Staff attended the U. S. Environmental Protection Agency Waste Isolation Pilot Plant Ground Water Technical Exchange.

Staff participated in the DOE's System Prioritization Method forum for Waste Isolation Pilot Plant stakeholders.

5.3.2 Speakers Bureau

A Speakers Bureau was initiated in 1995. A brochure describing the objectives of the Speakers Bureau, a sample of available topics and an invitation to the public to schedule Agreement-In-Principle speakers for organizational meetings was produced and widely distributed. As a result of this effort, AIP staff made presentations to such groups as the Civitan Associations in Albuquerque and Santa Fe and the Lions Club in Artesia.

A component of the Speakers Bureau is educational outreach. Staff made technical presentations at the Sandia National Laboratories Science Advisors Program's 1995 Fall Teaching Event for grades 3-8 science teachers and instructed a group of high school science teachers in the use of surface and ground water surveillance and monitoring equipment.

5.4 New Mexico Environment Department/DOE Meetings

5.4.1 General

AIP on-site points-of-contacts, and DOE on-site points-of-contact met regularly and communicated frequently to coordinate activities and to ensure thorough and mutual understanding and resolution of technical and administrative problems.

Staff attended the Actinide Source-Term Waste Test Program at Los Alamos.

AIP staff from the Waste Isolation Pilot Plant met regularly with DOE, Westinghouse and Sandia National Laboratories staffs to convey concerns and recommendations.

5.4.2 Bi-Monthly Meetings

Both the DOE staff and the AIP staff met bimonthly throughout the year. These meetings, which administrative staff members and points of contacts for each facility regularly attended, provided an avenue for improved coordination between the DOE and the AIP staffs.

6 TRAINING

6.1 Technical Training

Throughout the year, AIP staff attended workshops, seminars and classes that enhanced their technical skills. The subjects included:

* The Environmental Restoration '95 Convention in Denver, sponsored by DOE and hosted by the Rocky Flats Environmental Technology Site.

* The U. S. Environmental Protection Agency training seminar in Santa Fe on biologic assessment for environmental surveillance.

* The EPA Institute Seminar on Data Quality Objectives and Quality Assurance Management Plans.

* A training seminar on the use of kits manufactured by HACH Company for basic water quality analysis.

* A training seminar in Costa Mesa, California at the Environmental Education Enterprises, Inc. training center on Fractured Rocks: Characterization, Flow and Transport.

* The Los Alamos National Laboratory Environmental Restoration Technical Session concerning background element concentrations in soil, rock, and sediments of the Pajarito Plateau.

* The DOE Resource Conservation and Recovery Act Orientation Workshop in Idaho Falls.

* The Sandia National Laboratories' Resource Conservation and Recovery Act Corrective Action Management Unit Workshop.

* The New Mexico Geological Society Annual Field Conference.

* A course on effective business writing.

* The New Mexico Environment Department Bioremediation Conference.

* Statistical Methods in Ground Water Monitoring Studies.

* The Weather Spotter Group Workshop.

6.2 Worker Health and Safety Training

AIP staff attended a training course at Los Alamos National Laboratory concerning safety within the Explosives Corridor and use of the high explosives Spot Kit. This training is required by the DOE for entry to the explosive corridor at Los Alamos.

AIP staff attended OSHA's forty-hour and eight-hour hazardous waste operations training. This training is required by OSHA and the DOE for entry to hazardous and radiation areas at DOE facilities.

AIP staff attended DOE's Radiological Worker II, twelve-hour and four-hour training sessions. This training is required by the DOE for entry to radiation areas at DOE facilities.

AIP staff attended the DOE's general employee training eight-hour and two-hour courses. This training is required by the DOE for entry to the DOE's property.

AIP staff continue to participate in Los Alamos National Laboratory's personnel thermoluminescent dosimeter program for personal radiation monitoring during oversight activities at Los Alamos.

Employee baseline medical examinations were conducted under the medical surveillance contract for AIP staff who work in the field.

AIP staff attended training sessions for fire extinguishers use, first aid and cardiopulmonary resuscitation.

AIP staff attended a Mine Safety and Health Act forty-hour miner course and an underground miner refresher course.