

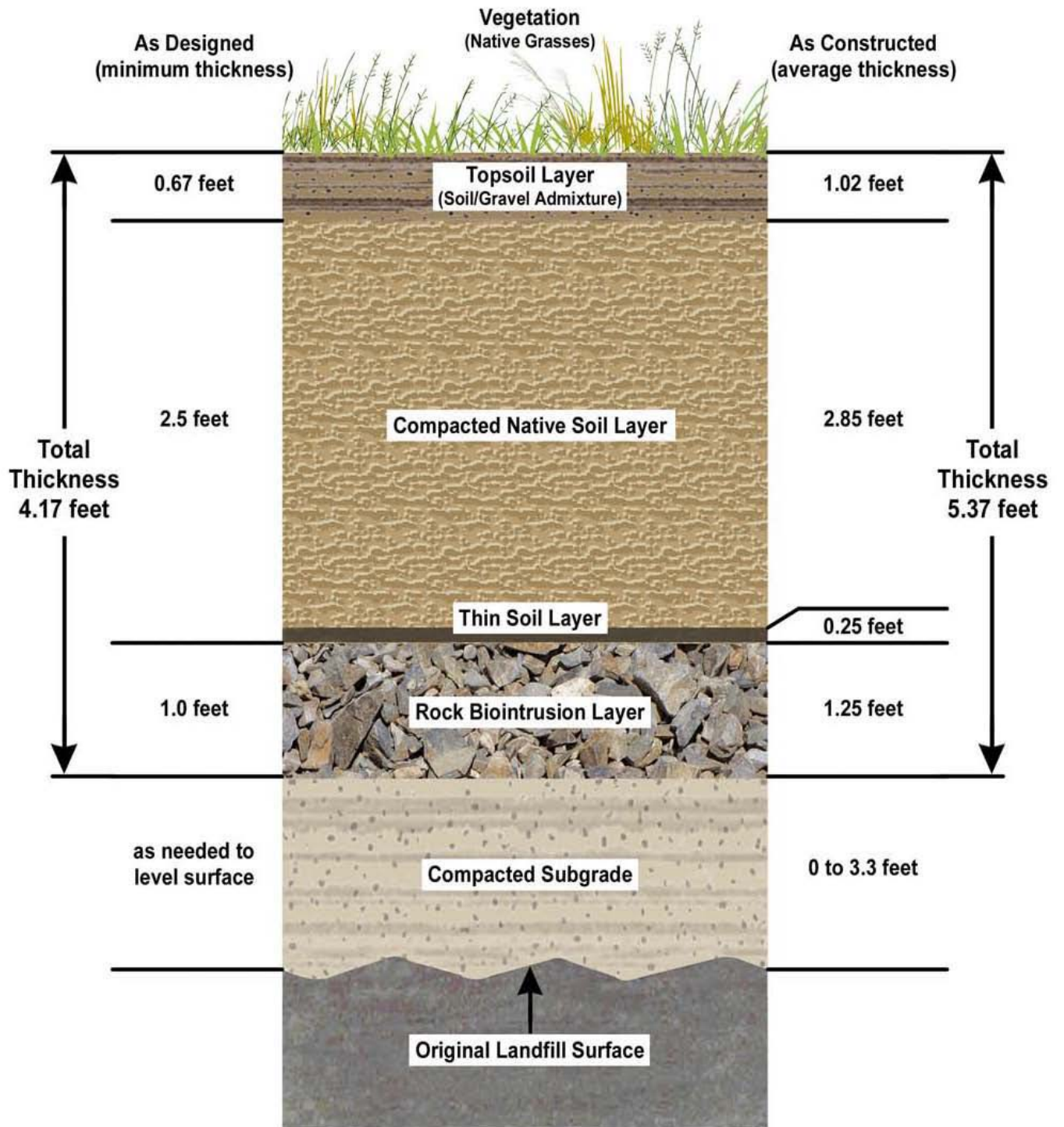


New Mexico Environment Department
DOE Oversight Bureau

Federal Fiscal Year 2010
First Quarter Report
October 1, 2009 to December 31, 2009



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



Cover Photographs

Mixed Waste Landfill Evapotranspiration (ET) Cover Development

Date: 10/05/06, Photo Taken by: Dave Ransbarger

Description: Overhead view of existing surface after clearing/grubbing.

Facing: Northeast

Date: 06/1/09, Photo Taken by: C. M. Timm

Description: Surveyor recording elevation of the Biointrusion Layer during installation to check and control thickness.

Facing: East

Date: 05/20/09, Photo Taken by: C. M. Timm II

Description: Beginning second phase. MWL Subgrade before 2009 clearing and preparation activities.

Facing: South

Date: 09/22/09, Photo Taken by: J. Schermerhorn

Description: MWL ET Cover with seed and mulch in place – grass seedling growth indicated by green areas.

Facing: South

Section detail of MWL ET Cover

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LIST OF ACRONYMS

AIP	Agreement-In-Principle
AIRNET	Air Radioactive Particulate and Tritium Monitoring Network at LANL
AQB	Air Quality Bureau (NMED)
BMP	Best Management Practices
BSL-3	Bio-Safety Lab, Level Three
CCNS	Concerned Citizens for Nuclear Safety
CDC	Centers for Disease Control and Prevention
CEMRC	Carlsbad Environmental Monitoring and Research Center (WIPP)
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980 (also known as “Superfund”)
CH Waste	Contact Handled Waste (WIPP)
COOC	Compliance Order on Consent
CRMG	Community Radiation Monitoring Group
CTAC	Carlsbad Technical Advisory Contractor
CWA	Clean Water Act
D & D	Decommissioning and Demolition
DARHT	Dual Access Radiographic Hydro Test Facility
DDT	DichloroDiphenylTrichloroethane
DOE	U.S. Department of Energy
DOE/NNSA	National Nuclear Security Administration of the DOE, operators of the LASO, SSO, and WSO
DOE OB	DOE Oversight Bureau (Bureau) of the NMED
DPR	Direct Penetrating Radiation
EA	Environmental Assessment
EMIG	Effluent Monitoring Improvement Group (WIPP)
EIS	Environmental Impact Statement
EES-6 Group	Earth and Environmental Sciences Division at LANL
EMSR	Environmental Monitoring, Surveillance and Remediation (Committee) (NNMCAB)
EPA	U.S. Environmental Protection Agency
EVEMG	Embudo Valley Environmental Monitoring Group
FFCA	Federal Facility Compliance Act
FFY	Federal Fiscal Year
GAP	Government Accountability Project
GIS	Geographic Information Systems
GNEP PEIS	Global Nuclear Energy Partnership Programmatic Environmental Impact Statement
GTCC LLW	Greater-Than-Class C Low-Level (Radioactive) Waste
HEPA	High Efficiency Particulate Air
HWB	Hazardous Waste Bureau (NMED)
IEER	Institute for Energy and Environmental Research
IWD	Integrated Work Document
LANL	Los Alamos National Laboratory, the physical location

LANs	LANs, LLC is the Los Alamos National Security, Limited Liability Corporation, the operators of the LANL facility
LANsCE	Los Alamos Neutron Science Center (LANL)
LASG	Los Alamos Study Group
LASO	Los Alamos Site Office (DOE)
LA-UR	Los Alamos – Unclassified Report (LANL)
LC/MS/MS	Liquid Chromatography/Mass Spectrometry/MS (Tandem MS)
LRRI	Lovelace Respiratory Research Institute (Formerly the Inhalation Toxicology Research Institute)
LVAS	Low-Volume Air Sampling
MDA	Material Disposal Area
MW	Monitoring Well
MWL	Mixed Waste Landfill (SNL)
NAS	National Academy of Sciences
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NMDOH	New Mexico Department of Health
NMDOT	New Mexico Department of Transportation
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
NNMC	Northern New Mexico College
NPDES	National Pollutant Discharge Elimination System
NNMCAB	Northern New Mexico Citizens’ Advisory Board
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
PCB	Polychlorinated Biphenyl
PPE	Personal Protective Equipment
QAPP	Quality Assurance Project Plan
RAC	Risk Assessment Corporation
RACER	Risk Analysis Communication Evaluation Reduction
RCRA	Resource Conservation and Recovery Act
RH Waste	Remote Handled Waste (WIPP)
RSRL	Regional Statistical Reference Level
R-Well	Regional Aquifer Monitoring Well
Ri-Well	Intermediate Aquifer Monitoring Well
SAP	Sampling Analysis Plan
SEIS	Site Environmental Impact Statement
Sandia	Sandia Corporation, the operators of the SNL/NM facility
SNL	Sandia National Laboratories/New Mexico, the physical location of the facility in Albuquerque
SSC	Suspended Sediment Concentration
SSO	Sandia Site Office (DOE)
SWMU	Solid Waste Management Unit
SWQB	Surface Water Quality Bureau (NMED)
TA	Technical Area
TLD	Thermoluminescent Dosimeter

TMDL	Total Maximum Daily Load
UNM	University of New Mexico
USGS	U.S. Geological Survey
VOC	Volatile Organic Compound
WIPP	Waste Isolation Pilot Plant, the physical location southeast of Carlsbad
WQH	Water Quality and Hydrology (LANL)
WRES	Washington Regulatory and Environmental Services
WSO	WIPP Site Office (DOE)
WTS	Washington Tru Solutions (WIPP), operators of the WIPP facility

DOE OVERSIGHT BUREAU SUMMARY

ADMINISTRATION

Los Alamos Section staffs continued organizing their new office and identifying punch list items for correction. The fume hood has been installed and is now fully operational.

Bureau staff has begun background research for updating the Price Agreement for analytical services. Certified commercial laboratories will be invited to respond to an Invitation to Bid (ITB) for professional services. Contract execution is anticipated to occur in April, 2010.

PERSONNEL

Two new staff members began work at the Los Alamos office during the first quarter of FFY 2010. Courtney Perkins was hired as an Environmental Scientist and Dan'l Martinez was hired as a Hydrologist. Ms. Perkins previously worked for the Drinking Water Bureau as an Environmental Scientist and was acting District II Area Manager. She holds a BS in Earth and Planetary Sciences (Summa cum laude) and Anthropology (Summa cum laude) and a MS in Earth and Planetary Sciences (Geology). Ms. Perkins previously managed staff in the compliance section of the Drinking Water Bureau and has direct experience evaluating environmental sample results, technical writing, public speaking, and presentations.

Mr. Martinez previously worked for the Oversight Bureau as a temporary employee and has demonstrated an ability to prosecute the work efficiently and with good results. He has a Bachelor's degree in Physics and Geology and has a good understanding of geodynamics. Mr. Martinez has a strong background in analytic mechanics and statistics and has demonstrated knowledge of subsurface hydrology. He has conducted well and spring water sampling for the bureau and has begun three dimensional modeling utilizing well completion reports and environmental water data to show extent of contamination plumes and potential pathways between aquifer zones.

FINANCE

Grant Amendment Modification #A051 was signed by Mr. Robert Lowther (Contracting Officer for DOE/NNSA) on August 1, 2009 in the amount of \$370,890 to fund continuing Oversight Bureau operations for the budget period beginning October 1, 2009.

TRAINING

Staff scientist Thomas Kesterson completed BE-100, the WIPP Beryllium Exposure Prevention Program. This training provides compliance with the US DOE requirements of Title 10 CFR Part 850, "Chronic Beryllium Disease Prevention Program", and is an element of WP 12 IH.02, the WIPP Industrial Hygiene Program. Mr. Kesterson also completed his annual Hazardous Waste Worker Refresher (HWW-102) training.

Bureau staffs participated in 40-hr HAZWOPER training and Staff Manager Steve Yanicak participated in the Department Health and Safety Committee meeting in Santa Fe.

During this period all bureau staffs with security clearances completed their 2009 NNSA Annual Security Awareness Refresher training.

Ms. Jennifer Brokaw attended Advanced Microsoft Excel Techniques training.

OUTREACH

Bureau staff members participated in various public meetings including department lead “Listening Sessions” around northern New Mexico as well as WIPP quarterly and CRMG meetings.

Bureau staff attended the Department of Energy (DOE)/Department of Defense (DoD) Semi-Annual Public Meeting held in Albuquerque on October 20th. The first of two hours was devoted to DOE topics. Sandia representatives presented the status of environmental restoration projects, long-term stewardship and Sandia ISO 14001 certification in the Environmental Management System. Sandia is the first corporation of its size to attain this prestigious certification. Sandia announced that 232 of 265 environmental sites have been submitted for closeout status. Three Area(s) of Concern (AOCs) are receiving continued monitoring. They are the Burnsite, the Tijeras Arroyo Group, and the Technical Area V (TAV). Both the groundwater and the soil are being characterized at the Burnsite for nitrate contamination. The groundwater beneath the last two sites has nitrate and TCE contamination.

Bureau staff attended the monthly meeting of the local American Water Works Association (AWWA). Steve Glass presented an overview of Stormwater Management at Bernalillo County, highlighting fecal coliform/e-coli and sediment as the two major contributors to pollution in the Rio Grande.

Dave Englert of the LANL Section met with members of the “Alliance for Nuclear Safety” and described the analytical techniques used to identify the difference between legacy plutonium from the Laboratory and integrated atmospheric fallout from nuclear testing. One of the members requested sample aliquots from areas containing known sources of legacy contaminants. The group is involved in a project using electron microscope techniques to identify elements and physical characteristics that might contain clues to their origin. Part of their technique requires establishment of a reference element library.

Bureau staffs from the Albuquerque, Santa Fe and Los Alamos offices participated in the LANL Area 3 Emergency Response Exercise. The joint Los Alamos County and LANL Emergency Operations Center (EOC) acted as Incident Command (IC) and coordinated with the State EOC, Oversight Bureau and Hazardous Waste Bureau. Bureau staff advised the IC of monitoring capabilities and staff availability. A follow up meeting will be conducted to improve response protocols.

Bureau staffs witnessed a penetration drop test of a TRUPACT III waste shipping container at the aerial cable test facility at Sandia. The 55,000 pound TRUPACT III (container) was dropped from a height of one meter onto an unyielding six inch diameter post. The container did not appear to have been penetrated and will be shipped back to the manufacturer for evaluation. The observed test was one of three conducted on the container. The first test was a corner drop from

30 feet onto an unyielding surface. The second drop test targeted the damaged corner of the container onto a six inch diameter post. Testing was scheduled to occur over two days however no drop tests were conducted on the first day because the internal temperature of the container (20 degrees below zero) required for the testing was not realized.

The “unyielding surface” is interesting in its own regard. The surface is a nine-inch thick steel plate embedded into a million pounds of monolithically cast steel reinforced concrete anchored with steel “I” beam sections into undisturbed bedrock. The six-inch diameter posts are then welded to the steel plate surface for the penetration tests.

LOVELACE RESPIRATORY RESEARCH INSTITUTE (LRRI) GROUNDWATER

Bureau staff continues to conduct groundwater sampling at the Lovelace Respiratory Research Institute (LRRI). This research facility, located at the southern border of KAFB, is not affiliated with SNL and is currently operated by the Lovelace Medical Group. Until recently, the facility was managed under the auspices of the DOE, and the transfer of ownership is being negotiated. Under these circumstances, the Bureau continues split samples with LRRI personnel. The most recent Groundwater Discharge Permit was signed with the NMED in 2008, and the only constituent of concern is Total Dissolved Solids. Bureau staff forwarded a final data submittal to DOE titled, “Groundwater Monitoring at Lovelace Respiratory Research Institute Conducted by NMED/DOE OB for FFY 2009 Q-3.” The Bureau collected groundwater samples from Lovelace Respiratory Research Institute (LRRI) monitoring well ITRI-MW4. Samples were submitted to an independent analytical laboratory for analysis of total metals, isotopic uranium, and total dissolved solids (TDS). Under the current discharge permit, LRRI is only required to sample total dissolved solids at monitoring wells ITRIMW4, -MW17, and -MW19. Total uranium was detected above the WQCC standard of 0.03 mg/L at a concentration of 0.047 mg/L and the TDS concentration of 1400 mg/L exceeded the WQCC standard of 1000 mg/L at ITRI-MW4.

LOS ALAMOS NATIONAL LABORATORY OVERSIGHT

GENERAL ADMINISTRATION (LAD01)

Under this Activity ID, the Bureau manages, administers, and finances the overall activities of staff members in the LANL and Santa Fe offices. Staff provides assistance to the Bureau and DOE developing workplans, budgets and training requirements.

Quarterly Summary: During FFY10 Q-1, two staff members were added to the LANL Oversight Section (LOS) to enhance capabilities in surface water and hydrogeology issues.

The Bureau welcomed new staff members Courtney Perkins and Dan'l Martinez to the LOS at the Los Alamos office. Ms. Perkins comes to the Bureau from the NMED Drinking Water Bureau and will be working on surface water issues including consultation and field activities involving the LANL NPDES Multi-Sector Permit. Mr. Martinez recently graduated from UC Berkeley and has a double degree in physics and geology. He replaces Michael Dale who departed in the fall of 2008 in the position of hydrologist. Mr. Martinez will work predominantly on hydrogeology issues and data gathering concerning the on-going investigations at TA-54, 21, 33, canyon bottoms, and the Sandia/Mortandad Canyon chrome plume in support of both NMED and LANS.

The LOS personnel that conduct field and sampling activities completed biennial physicals as required by the Health and Safety Plan for the Bureau. Ms. Perkins also completed the required basic training and refresher courses, including HAZWOPER Refresher and Radiation Worker II. All staff members holding Q-Clearances completed their Annual NNSA Security Awareness Refresher Briefing.

The newly-hired staff members, Ms. Perkins and Mr. Martinez, attended a two-day ArcGIS Basics course through the Northern New Mexico College (NNMC) in Espanola. The course provided the basics of ArcGIS and data resources for future use.

PUBLIC OUTREACH (LPO02)

Under this Activity ID, Bureau staff interacts with the public through meetings, listening sessions, website development, consultations, and reports.

Quarterly Summary: During FFY10 Q-1, Bureau staff met with various activist groups, hosted meetings of the CRMG, and monitored technology developments at LANL concerning explosive debris containment.

Bureau staff met with members of the Alliance for Nuclear Safety (ANS) to describe the analytical techniques the Bureau uses to identify the difference between legacy plutonium from the Laboratory and integrated atmospheric fallout from nuclear testing. One of the members requested sample aliquots from areas containing known sources of legacy contaminants. The Group is involved in a project using electron microscope techniques to identify elements and physical characteristics that might contain clues to their origin. One aspect of the techniques

requires establishment of a reference element library. No follow-up meetings have been planned at this time.

Bureau staff hosted the Community Radiation Monitoring Group (CRMG) Meeting held on Wednesday December 16, 2008 in Espanola at the Northern New Mexico College. Eleven representatives of NMED (DOE OB), LANL, Pueblo de San Ildefonso, NGOs (Cultural Energy, Taos, and Embudo Valley Environmental Monitoring Group) and the public attended the meeting. The next CRMG meeting would be held at NNMC on January 13, 2010. The topic of the December meeting was “Overview of New Mexico Area 3 (Los Alamos) Functional Exercise 2009.” The NMED gave an overview of the purpose, scope and history of the Area 3 Exercise and participants discussed areas for improvement. The media wanted greater coverage and others wanted better emergency communications and openness regarding the exercise scenario. Notes of the meeting are available at the Bureau office in Los Alamos.

The LANS staff successfully performed the first hydrodynamic test in the “Enhanced Containment Alternative” system at the TA-15 Dual Axis Radiographic Hydrodynamic Test (DARHT) facility. The test demonstrated that NNSA will be able to ensure the safety, security, and effectiveness of the national nuclear deterrent stockpile without the use of actual nuclear warheads. The specially designed double-walled containment vessel used two giant X-ray machines set at right angles to provide a more complete picture of how surrogate nuclear materials behave during an implosion event. The Bureau has been instrumental in the selection of the DOE design and development options for the DARHT project. Beginning in 1995 and culminating in this recent successful test, the Bureau, along with other agencies such as EPA Region 6 and NGOs has provided reviews and comments for prudent designs that would minimize impacts to the environment. The “Enhanced Containment Alternative” for DARHT was the addition of a means (containment) to prevent the release of most or all airborne emissions, metal fragments, and other debris resulting from firing-site operations.

GENERAL ER/EM PROJECTS (LGE03)

Under this Activity ID, Bureau staff provides verification and validation of projects conducted by LANS to remediate environmental and human hazards from legacy waste and to monitor current activities for safe practices.

Quarterly Summary: During FFY10 Q-1, Bureau staff developed a White Paper delineating NMED activities in support of the Buckman Direct Diversion (BDD) Project from the inception through 2009.

The BDD project will provide Santa Fe and surrounding areas with an additional drinking water source. The Bureau has been an active participant in this effort providing technical expertise and environmental sampling and analysis. In 2007 the BDD Board asked NMED, specifically the Oversight Bureau, to provide environmental surveillance support.

Los Alamos Watershed Restoration Efforts-

The DOE OB provided this support by:

- Delineating an abandoned river channel along the Rio Grande near the water diversion site that contained sediments contaminated by legacy wastes;

- Recommending stabilization projects in the Los Alamos Watershed that might reduce contaminated sediment transport; and
- Continuing to monitor storm water in the watersheds.

The Bureau identified contaminants, degree of contamination, source; and delineated horizontal and vertical extent of contaminants in an abandoned channel near the proposed BDD construction site. These efforts were completed in coordination with the Buckman Direct Diversion Board (BDDDB), NMED Hazardous Waste Bureau (HWB), and the US National Forest Service. Follow up studies have been conducted with the Wildlife Federation to assure proposed plans for a riparian restoration and recreation project in the area do not intersect the contaminated channel.

Additionally, the Bureau was involved during early planning of construction details through multiple BDDDB, LANL, and HWB meetings, plan review, monitoring building activities and completion details, and continuing assessments to determine the success matrix of these projects. The Bureau has already teamed with these agencies to provide recommendations that support improvements to the plan.

Stormwater efforts during 2009-

DOE OB's stormwater monitoring efforts during the summer of 2009 fulfilled two primary functions;

- On-going monitoring of contaminant transport by stormwater from LANL; and
- Supported Santa Fe County and municipal BDD efforts to develop a reliable, safe drinking water source from the Rio Grande.

Sample collection efforts continued within the Los Alamos watershed on evidence of an increased transport of sediments contaminated with legacy wastes since the Cerro Grande fire in 2000. Four events were sampled that included two storm flows on July 31 and October 13 in Los Alamos Canyon 0.5 mile above its confluence with the Rio Grande and two flows on July 5 and 6 within Pueblo Canyon, an established major source of contaminants. A sample was collected from a concurrent storm flow on July 6 within the mid reach of Los Alamos Canyon above the Pueblo Canyon confluence.

Bureau efforts also focused on regional storm surges within the Rio Grande. Multiple storm surges were sampled at five locations along the Rio Grande watershed; two locations are above the Rio Chama and upper Rio Grande confluence (at Lyden on the Rio Grande and Chamita on the Chama), the Otowi Bridge and Buckman Direct Diversion sites along the Rio Grande are above and below the Los Alamos watershed confluence respectively, and the most downstream station (Rio Grande above Alameda) is near the Albuquerque water diversion from the Rio Grande. Analytical results from these storm water surge samples along with duplicate LANL-DOE OB on-going base-line flow samples from Otowi and Buckman sites along the Rio Grande will provide a range of background radiochemical and chemical levels that might be expected in the Rio Grande. Researchers are hopeful that future measurements of Rio Grande waters that are distinguishable from these background references may help identify contaminant sources.

LANL section personnel submitted nineteen (19) Rio Grande regional samples and two samples from a July 31 watershed event in lower Los Alamos Canyon station E110. Fourteen samples are archived pending analysis. The majority of these samples are from the Los Alamos watershed but also include two Rio Grande samples collected on October 13. Of special note is that the October 13 event may become a fairly important sample set because it is the first set to include stormwater samples from the lower Los Alamos site collected simultaneously with samples at Otowi and Buckman. An earlier estimation of plutonium^{239/240} concentrations in the Rio Grande from a large Los Alamos Canyon storm event (August 8, 2006) indicated levels may have been as high as 287 pCi/L. Those levels would have been temporary and would have diminished as the storm surge declined.

Alpine Study Overview

The Alpine study now in its second year and its main purpose is to measure the general abundances, concentrations and variations of radionuclides and trace metals in sediments and soils at high mountain altitudes in the northern region of the state. Local organic farmers and citizen activist groups share concerns over the results of the study because many of these people live and farm in the lower valleys which have their water source originating at many of the study's collection sites. When asked to comment on the quality of water that flows down from these high mountain watersheds many locals recall the Cerro Grande fire of 2000 and note their general concern of being in the "shadow of Los Alamos."

Just over 50-miles from Los Alamos, the Dixon/Embudo area is one of several agricultural regions that stakes its business survival on maintaining produce that meets a strict definition of "organically grown." The Bureau's radionuclide measurements of local watershed soils that are verified to be at or below background levels still draws concern from many area farmers however this information helps to combat negative perception at local and Santa Fe markets when asked if their produce is grown "downwind of Los Alamos."

State researchers also hope to gather enough information that will allow them to interpret and/or corroborate known trends or patterns of radionuclide dispersion in the high elevations so to be able to distinguish possible source terms of the radionuclides. Most of the measurements found through the study, except for those at the highest elevations, are at or near assumed background levels. Several collective methodologies are used to investigate subtle differences between fallout source terms such as regional atmospheric, Nevada Test Site derived and LANL-derived.

Alpine Study Field Activities

LANL Section personnel and representatives from the Embudo Valley Environmental Monitoring Group (EVEMG) collected two soil samples from four sites at 1,000 foot intervals along the Rio Trampas. Staff collected two samples at each site; one from flood plain structures along the stream, and one from terraces above the stream. The floodplain samples may demonstrate potential alluvial transport of radionuclides while the terrace samples may represent atmospheric deposition of the fallout contaminants. The Bureau's mid and late October efforts reflect the first phase of this collection project. Staff collected samples at elevations ranging from 11,400 to 9,000 feet. In November Bureau staffers expected to return and complete the project. Representatives of this bureau and EVEMG will collect samples from the 9,000 foot elevation site to approximately a 6,000 foot elevation near the Rio Grande. After all the samples

are collected they will be submitted for radiochemical analysis of plutonium, americium, uranium, strontium, and cesium isotopes.



Ralph Ford-Schmid and Dave Englert collecting soil samples for radionuclides as part of the Bureau's Alpine Study. Members of the Embudo Valley Environmental Monitoring Group (EVEMG) can be seen behind Dave taking notes (Sheri Kotowski and Yesca Sullivan). Samples were collected in floodplain and terrace deposits along the Trampas River at 1,000 foot gradients from 11,000 feet to 6,000 feet in the El Valle area.



Ralph Ford-Schmid collecting soil samples in the El Valle area along the Trampas River for radionuclides and metals as part of the Bureau's Alpine Study. The steel ring in the photo is pounded into the ground and carefully lifted out to produce a sample. Up to three rings are generally taken in a small area to yield one composite sample at each location

Bureau personnel also continued the soil collection project within El Valle. This effort is an extension or supplement of the Bureau's Alpine project in which we've identified radioactive materials in northern New Mexico montane and alpine regions at levels greater than existing

fallout reference values from atmospheric testing of nuclear weapons. The purpose of this effort is identify at what rate, if distinguishable, the contaminants are being transported downstream and whether there's a hypothesized correlation of contaminant deposition to elevation.

DIRECT PENETRATING RADIATION PROJECT (LDP04)

Under this Activity ID, Bureau staff monitors the environment at LANL and in the vicinity for gamma radiation that could be LANL-induced or ambient. The on-going program reads electrets at the end of each quarter, records data in field books, converts readings into quarterly dose values, and submits quarterly results for DOE, LANS and the public.

Quarterly Summary: During FFY10 Q-1, Bureau staff continued to conduct direct penetrating radiation monitoring at stations on LANL property and the surrounding area.

Bureau staff continued to collect Electret data at sites co-located with LANS units (one site is monitored independently). The Bureau will distribute an annual report during FFY10 Q-2 for the monitoring on and off LANL property.

PARTICULATES LOW-VOLUME AIR PROJECT (LPL05)

Under this Activity ID, Bureau staff conducts continuous air monitoring for radioactive particles and tritium using low-volume air pumps. Filter samples and gel collectors are submitted and analyzed quarterly and results are provided for DOE, LANS and the public.

Quarterly Summary: During FFY10 Q-1, Bureau staff continued monitoring air quality for radioactive particulates at stations co-located with LANS units. The latest results have been comparable, and they will be published in the near future.

The DOE/LASO Point-of-Contact, Jeff Casalina, notified the Bureau that the LANS Radiation Health Physicist had reviewed the latest AIRNET data submittal by the Bureau. The review found the tritium, plutonium, americium, and uranium results for the five co-located perimeter stations to be within ambient or routine levels usually measured by the LANS AIRNET stations. The data results reside in the Bureau database and can be compiled for release to members of the public upon request.

PARTICULATES HIGH-VOLUME AIR PROJECT (LPH06)

Under this Activity ID, Bureau staff conducts continuous air monitoring for radioactive particles, metals and organic compounds using high-volume air pumps to independently monitor environmental restoration clean-ups and D&D operations. Filter samples are submitted and analyzed quarterly and results are provided for DOE, LANS and the public.

Quarterly Summary: During FFY10 Q-1, Bureau staff continued to monitor LANL air quality from perimeter stations, and TA-21 building demolition airborne debris from a solar-powered station located in the predominant wind pathway.

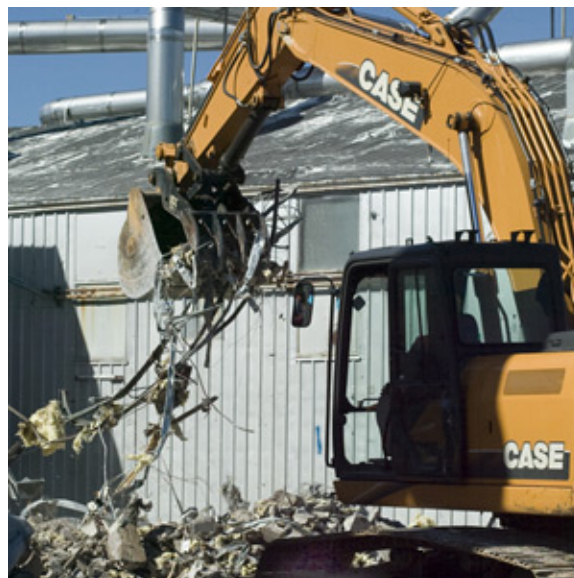
Bureau staff continued the operation of the perimeter AIRNET units and the solar-powered air monitoring unit at the Los Alamos County Airport. The solar-powered unit is located directly north, (in the predominant wind pathway) of TA-21 buildings being demolished.



Looking directly south at the DP East facility where D&D activities began (see the DP East water tower in the background as a reference). Bill Bartels performs the final systems check on the Bureau's air monitoring equipment stationed at the Los Alamos County airport.

In consideration of seasonal wind direction information, the Bureau's monitoring unit is parked directly across from and in a predominant north-east direction from the TA-21 DP East area. In coordination with LANL Air Quality Group and Los Alamos County officials the location of the Bureau's unit was selected to fill a gap between two existing LANL AIRNET monitoring stations at the airport.

On December 1, 2009 Los Alamos National Laboratory began the demolition of several Cold War-era buildings that once housed plutonium production and historic, non-weapons research. The LANS staff accelerated the demolition and cleanup timetable of Technical Area 21 because a \$212-million award was granted from the American Recovery and Reinvestment Act (ARRA). More than 165, 000 square feet of former research, production, and office spaces were razed during the activities. Demolition rubble from the buildings was recycled where practical or sent to licensed disposal sites. Contaminated rubble was sent to sites in Utah or Nevada in approved transportation containers.



Left image: Building 21-370 at DP East prior to demolition.

Right image: Building 21-370 at DP East after demolition. After 23-minutes, rubble is all that remains. (Before and after pictures of Building 21-370 are courtesy of LANS LLC., PIO.)

Recovery Act funding will also be used to clean up the first waste disposal pits used from 1944 through 1948 and to install 16 new groundwater monitoring wells.

DRINKING WATER MONITORING (LPW07)

Under this Activity ID, Bureau staff conducts annual sampling in a cooperative event with LANS Water Quality and Hydrology, Los Alamos County, and San Ildefonso Pueblo for supplemental and verification sampling of LA County and San Ildefonso Pueblo production wells. Generally, the analytes are substances not addressed under Safe Drinking Water Act.

Quarterly Summary: During FFY10 Q-1, there has been no activity.

GROUNDWATER MONITORING (LMW08)

Under this Activity ID, Bureau staff conducts verification and supplemental sampling of the LANL Regional Wells in cooperation with LANS Water Quality and Hydrology, Los Alamos County, and Pueblos of San Ildefonso and Santa Clara.

Quarterly Summary: During FFY10 Q-1, Bureau staff finalized an assessment of the LANL Facility-Wide Groundwater Monitoring Plan, sampled wells and springs, and participated in the review of a technical abstract on radiocarbon dating.

Bureau staff assisted NMED staff to finalize and submit a technical review assessment for use by the Hazardous Waste Bureau (HWB) on the LANL 2009 “Interim Facility-Wide Groundwater Monitoring Plan.” Staff noted that several questionable assumptions were made by LANS including using a hardness of 100 mg/L for all metals calculations instead of using a site-specific hardness for calculation of metal concentrations. Staff also noted the improper use of some

Water Quality Control Commission Standards. Maximum Contaminant Levels (MCLs) and some analytical methods were used that may not have been appropriate for the study.

Bureau staff and NMED/HWB staff surveyed and sampled several pre-1950s wells in the Valle Caldera for oxalate, perchlorate and water quality parameters. A spring source area was also sampled for water characterization constituents within a mile of the wells. The wells surveyed included H-5, H-6 and the spring identified as 15-VT-1 Spr 1014a (previously identified as Spring 1). Other wells on LANL property were sampled for oxalate, perchlorate, tritium, C-14, stable isotopes and metals. Those wells were CDV-16-2ir, CDV-16-1(i), CDV-5.97 Spring, SCI-2, R-37 Screen 2 for HWB; and SCA-2 and SCA-4, R-49 scr1, R-48 and R-41 Scr 1; and Water Canyon Gallery and Martin and Burning Ground Springs at TA-16 within the S-Site explosive corridor. The data results support on-going independent projects and joint studies with LANS.



Left image: Dave Englert identifying well H-4.



Right image: Dan'l Martinez and Kim Granzow collecting water quality parameters from well H-6 (right pix). Water quality from the Valle Caldera is among the most pristine the Bureau has observed in New Mexico.



Left image: Dave Englert, Kim Granzow, Michael Dale and Dan'l Martinez collecting samples from 15-VT-1 Spr 1014a, located in the Valle Caldera Preserve.

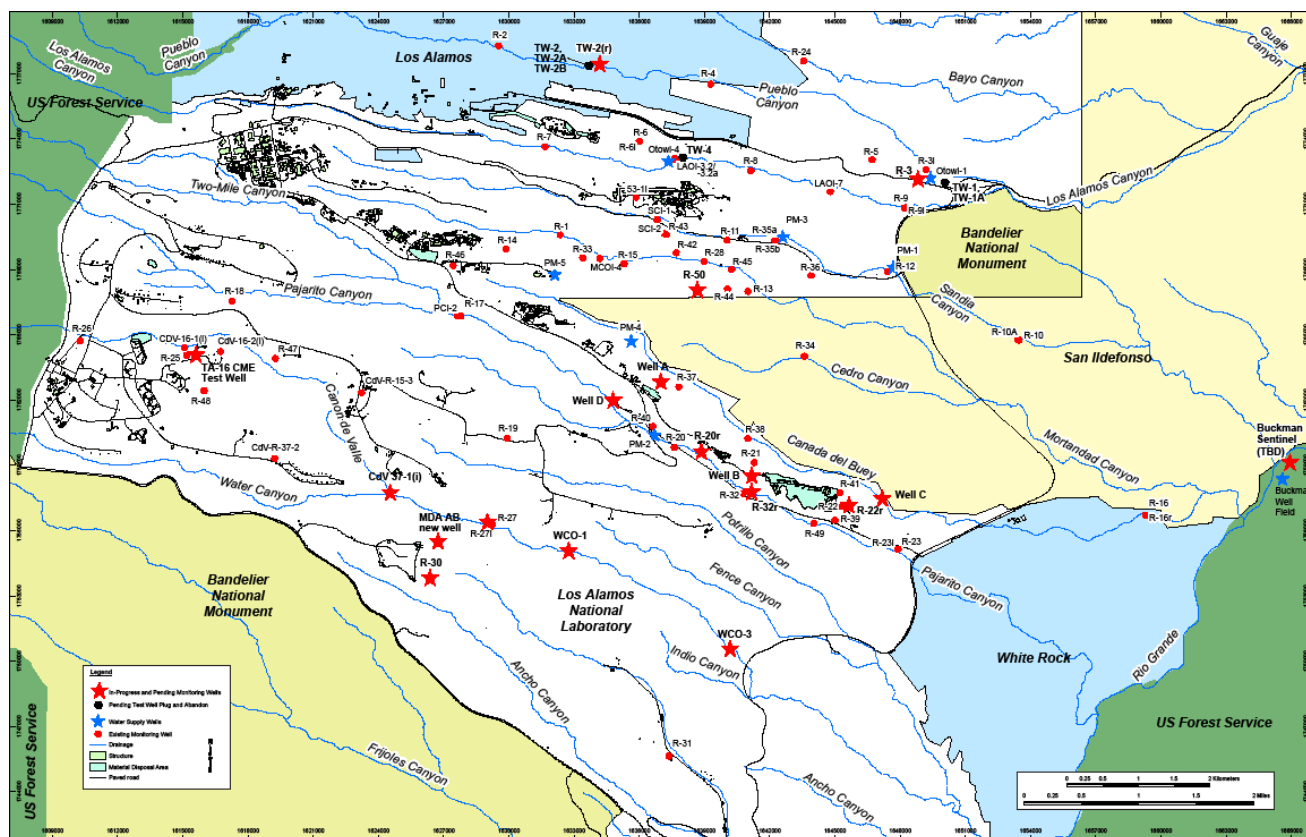
Right image: Dan'l Martinez collecting a 14C sample from Dan'l Spring.



Courtney Perkins and Dan'l Martinez collect samples for stable isotopes, oxalate and water quality parameters at PC Spring in upper Pajarito Canyon. In the photo, Courtney is using the Geopump and 0.45um filter to purge the line prior to sampling

Bureau staff collected samples at CDV Spring in Canon de Valle for stable isotopes, oxalate and water quality parameters. Analysis for “tracer constituents” at distal locations from LANL that are considered to exhibit “background” conditions will help investigators revise inputs for the improvement of the Pajarito Plateau (LANL) site hydrogeologic conceptual model for recharge, discharge and flow pathways.

Bureau staff attended briefings on the current status of the chrome investigation being conducted by LANS. High concentrations of chromium have been found in several regional wells on the Pajarito Plateau and sampling, analysis, and modeling are being undertaken in an attempt to derive the origins. Staff also participated in a discussion on plugging and abandoning plans for TW-2, 2A and 2B.



Bureau staff discovered two new springs feeding Peralta Canyon in the vicinity of Los Alamos. GPS coordinates, water quality and water chemistry parameters were collected. Sample suites for both springs included C-14, tritium, oxalate, major isotopes, trace elements and major anions and cations. One of the two springs will be used as a background oxalate station.

Bureau staff was joined by HWB staff to collect snow and soil core samples for a joint Soil Column Leachate study with LANS investigators. The study will help provide validation information in support of the ongoing radiocarbon (C-14) dating project. Staff also hopes the study will lead to the identification of possible sources and/or mechanisms for the occurrence of natural perchlorate. Perchlorate is routinely measured at sub-ppb concentrations in many ground water samples taken from sites on the Pajarito Plateau. These sites have been assumed as background from human interaction. However, even these low-level concentrations have created high-level interest in the scientific community. Seemingly, perchlorate is naturally-occurring, but the substance was previously thought to only occur in the environment through man-made impacts (e.g., rocket fuel production etc.). Although most investigators now agree that naturally-occurring or background perchlorate exists and can be detected by more precise and accurate

methods (IC/MS/MS etc.), it is usually not detected at more than one ppb in water samples assumed to exhibit background conditions. Continuing studies worldwide soon hope to isolate certain isotopic indicators between natural and man-made perchlorate. For this joint study, water analyses will include anions, C-14 and low-level perchlorate in addition to bulk mineralogy including clays. The study should support the Bureau's radiocarbon water dating project to help validate the initial recharge water C-14 signature and thus confirm the indicated C-14 age of the water. The study will also address concentrations of calcium carbonate in the soils, and measurements of before and after concentrations of calcium carbonate and perchlorate in the water (snow melt collected for this study near the Pajarito Ski Area) being flushed through the soil cores (in laboratory bench top columns).



Left image: Courtney Perkins scoops out fresh snow into a 1-L container for the joint LANL-NMED Soil Column Leachate study.

Right image and below: Michael Dale, Dan'l Martinez, and Dave Englert collect soil core samples.



WR SPRINGS MONITORING (LSM09)

Under this Activity ID, Bureau staff conducts annual sampling in a cooperative event with LANS Water Quality and Hydrology and San Ildefonso Pueblo. The sampling includes approximately 25 groundwater springs off-site from LANL and on San Ildefonso Pueblo in White Rock Canyon along the Rio Grande.

Quarterly Summary: During FFY10 Q-1, Bureau staff conducted routine maintenance on sampling equipment and shipped samples for analyses.

STORMWATER BELOW SWMUS PROJECT (LSF10)

Under this Activity ID, Bureau staff conducts on-going sampling of storm water discharges from Solid Waste Management Units (SWMU) and Areas of Concern (AOC) for compliance with Federal Facility Compliance Agreement and the General Storm Water Permit.

Quarterly Summary: During FFY10 Q-1, Bureau staff sampled a seepage point and monitored LANS remediation of a PCB-contaminated site.

Bureau staffs routinely observe SWMU LA-SMA-2, the site of a PCB/uranium cleanup in progress. From these observations, staff provide guidance on proposed remediation and site stabilization plans. Staff collected samples of the alluvial groundwater discharging from a seep near the bottom of the site before any remediation had occurred. Results show PCB levels of 589 ng/L (42 times the wildlife habitat criteria) and congener patterns predominantly matching Aroclor 1254 and Aroclor 1260 (83% and 12% respectively). These congeners are generally associated with industrial uses such as cutting oils and transformers and may have been used in uranium milling operations during the Manhattan Project. Under the Consent Order agreement with the State of New Mexico, LANS must complete the field work by the end of December. By that time most of the sediment from the drainage below the septic tank outfall (200 cubic yards) had been removed by work crews using hand tools and a truck-mounted vacuum. Nearly 1,500 additional cubic yards has been removed from the canyon bottom near Los Alamos Canyon. Staff observed the installed BMPs which appear to be filtering any alluvial water discharged from the site prior to its confluence with Los Alamos Canyon stream.



Left image: LA-SMA-2 PCB Cleanup Excavation and BMPs near Los Alamos Canyon stream.

Right Image: LA-SMA-2 PCB Cleanup Workers vacuum contaminated sediment from the drainage below septic tank.

STORMWATER WATERSHED PROJECT (LSW11)

Under this Activity ID, Bureau staff conducts on-going sampling of LANL watersheds for water quality standards compliance verification. The focus is on post Cerro Grande fire plutonium inventory transport assessments in Pueblo and Los Alamos Canyons and cooperative watershed monitoring with San Ildefonso Pueblo.

Quarterly Summary: During FFY10 Q-1, Bureau staff collected sediment samples in Pueblo Canyon to assess effectiveness by LANS to mitigate contaminated sediment transport to the Rio Grande.



Staff members collected sediment samples for analysis of radionuclides in the middle reach of Pueblo Canyon below the Los Alamos County Airport.

Historically, the Pueblo Canyon watershed produces the most significant amount of LANL-derived contaminants off-site and ultimately to the Rio Grande. LANS staff recently installed engineering structures in a section of the Pueblo Canyon drainage to mitigate the erosion and transport of contaminated sediments by controlling the water velocity. Bureau personnel collected sediment samples up-gradient and down-gradient of the structures in Pueblo Canyon. Analysis of the samples will determine the effectiveness of the structures.

NPDES MONITORING ASSESSMENT PROJECT (LPN12)

Under this Activity ID, Bureau staff conducts on-going sampling of National Pollution Discharge Elimination System (NPDES) outfalls and outfall closure verification. The focus is on stormwater management assessment at construction and Environmental Restoration remediation projects. Staff verifies that LANS has proper spill action plans, and staff provides closeout assessment and recommendations.

Quarterly Summary: During FFY10 Q-1, reviewed technical papers, provided site assessments at various remediation projects, and made spill closure report recommendations to DOE.

Bureau staff is drafting an article titled “Top Soil and other Natural Erosion Control BMPs, Use or Lose” for publication in a national magazine. The article discusses innovations being tried at LANL to use naturally available resources and should be ready for publication in FFY10 Q-3.

Bureau staff attended a lecture presented by the International Erosion Control Association Mountain States New Mexico Chapter titled “Techniques for Reclamation - Seeding for Success.” The lecture discussion focused on proper seeding techniques, calculation of seeding densities, and seeding practices for arid climates. Staff hopes to see some of these techniques employed at LANL for better erosion control.

Bureau staff attended a lecture at the University of New Mexico presented by Dr. William F. (Bill) Hunt, Ph.D., PE titled “Best Management Practices for Stormwater Management, Advancements in Research and Considerations for Semi-Arid Climates.” The discussions that followed focused on Best Management Practices (BMPs) concerned with stormwater wetlands, permeable and porous pavement systems, catchment basins, green roofs, and buffer and level spreaders.

Bureau staff conducted the following NPDES Site Assessments and Evaluations:

- Use of juniper bales as BMPs for erosion and sediment controls at LANL. After coordination with LANS, staff plans to conduct a short overview and field demonstration of the technology.
- Site visit of the TA-22 historical photo-outfall canyon-side release area noted for its copper and cadmium contamination. Staff accompanied LANS personnel to assess the use of juniper bales for erosion and sediment controls.
- Review with LANS staff the future Demolition and Decommissioning work at the TA-54 Area G site. The group reviewed the Multi-Sector General Stormwater, Storm Water Pollution Prevention Plan.
- Assessment of a large (1,300 cubic yard) PCB remediation project at TA-21. With ARRA funding, LANS staff has accelerated the D&D project at TA-21. Many of the surface structures are scheduled to be eliminated before 2012. Much of the PCB site had already been remediated to meet the post-remediation target concentration of 1ppm. Bureau staff reviewed the erosion and sediment control BMPs at the site and concluded they were adequately installed and maintained to prevent stormwater runoff from entering Los Alamos Canyon. LANS site workers were removing for disposal soils containing greater than 50 ppm first and will proceed on to soils containing less than 50 ppm as soon as possible. The remediated site will then be converted into a lay-down and staging area for the rest of the TA-21 D&D project.
- Site evaluation of an approximately 25,000 gallon or greater potable water release at TA-21, Building 346. The heavy vegetation in the area played a vital role in countering any erosion impacts from the site but due to the large volume of the discharge several recommendations were made by the Bureau for remediation and mitigation of the site. The recommendations included road and berm maintenance, asphalt reinstallation, best management practice (BMP) instillation, and overall site mitigation.

- Assessment of low-head weir and basin construction in Los Alamos Canyon. The Bureau distributed a report titled “NMED-DOE OB Site Evaluation Report for Storm Water and Erosion Controls at the Low-Head (Flood Control Structure) Weir and Retention Basin in Los Alamos Canyon, Technical Area (TA)-72, on August 3, 2009.” This report summarized the Bureau participation in a site evaluation for stormwater and erosion controls on August 3, 2009, at the Low-Head (Flood Control Structure) Weir and Retention Basin in Los Alamos Canyon, Technical Area (TA)-72. The Bureau determined that site BMPs were appropriately designed, installed, and maintained. The overall site housekeeping was adequate, and the site construction was near the final stabilization and Notice of Termination (NOT) final approval phase. The Bureau concluded that site erosion, sediment control, and site stabilization efforts had been thorough and effective.



Left image: New BMPs on north slope above Low Head Weir in Los Alamos Canyon.

Right image: Recently excavated sump area behind the Low Head Weir in Los Alamos Canyon and August 2009 storm water accumulation (view is looking to north east, the weir can be seen in the distance to the right).

Bureau staff provided DOE with assessments of LANS spill remediation's as follows:

- “Spill Response Assessment and Suggestion for Closure of Steam Condensate Water Line Release at TA-3, Building 261, September 11, 2009, LANL Discharge Notification Report # 225.” The approximate amount of the discharge was 4,320 gallons over a 16-day interval. This release was reported to the NMED Emergency Spill Hotline as required by 20.6.2.1203 NMAC of the Water Quality Control Commission on 9/11/2009. Even though the leak did not surface until August 31, 2009 Laboratory Utilities personnel did notice a “moist area” as of August 6 and executed an excavation permit in order to identify the source of the moisture. On September 11, LANS/ENV WQ/RCRA personnel discovered that the condensate water was entering a nearby storm drain inlet and was flowing into upper Sandia Canyon. Facility personnel identified the leak location and repaired the lines on September 16. The spill flowed over Solid Waste Management Unit (SWMU) 3-013(a)-00 but no erosion impacts were noted due to the low flow rate of the release. Following the review of both the 7- and 14-day spill response action reports a recommendation of “no further action” under the discharge notification was transmitted to LANS indicating that the actions were adequate for protecting the environment.

- “Spill Response Assessment and Suggestion for Closure of Potable Water Release at TA-16 along West Jemez Road, October 20, 2009, LANL Discharge Notification Report # 233.” The approximate amount of this discharge was 1,000 gallons of potable water caused by a leak in a 6-inch potable water main at TA-16, West Jemez Road just before the State Road 4 intersection.
- “Spill Response Assessment and Suggestion for Closure of Potable Water Release at TA-18, Building 28, October 20, 2009, LANL Discharge Notification Report # 230.” The approximate amount of the discharge was 300 gallons of potable water caused by a leak in a fire suppression line at TA-18, Building 28, from a standpipe adjacent to the building.
- “Spill Response Assessment and Suggestion for Closure of Potable Water Release at TA-16, Building 202, October 24, 2009, LANL Discharge Notification Report # 235.” The approximate amount of the discharge was 10,000 gallons of potable water caused by a ruptured 4-inch potable waterline on the west side TA-16, Building 202.
- “Spill Response Assessment and Suggestion for Closure of Potable Water Release at TA-18, Building 30, October 23, 2009, LANL Discharge Notification Report # 234.” The approximate amount of the discharge was 6,500 gallons of potable water caused by a ruptured 4-inch fire suppression line located in a utility box at the west end of TA-18, Building 30.
- “Spill Response Assessment and Suggestion for Closure of Potable Water Release at TA-21, Structure 346, November 11, 2009, LANL Discharge Notification Report # 237”. The approximate amount of this discharge was 25,000 gallons of potable water caused by a ruptured 8-inch water main located southwest of TA-21, structure 346. Water flowed onto the canyon side, onto an access road, and then entered the DP Canyon Watercourse. On November 19 the TA-21 water system pressure alarm notified utilities personnel of a pressure drop in the fire suppression system. The water was shut off at approximately 6:30 p.m. and the water line was shutdown for repairs. On November 19, 20 and 23 Bureau staff met with LANS WQ-RCRA staff to assess the release impacts and discuss stabilization of the impacted areas on the DP canyon side and access road. Water flowed over a small portion of Solid Waste Management Units (SWMU) 21-024(h) and Area of Concern (AOC) C-00-21 without apparent impact to the DP watercourse due to the amount of vegetative buffering along the flows path. Suggestions were made to LANS staff to install preventive BMPs and to stabilize the access road.
- “Spill Response Assessment and Suggestion for Closure of Potable Water Release at TA-53, Water Tank 987, November 30, 2009, LANL Discharge Notification Report # 238”. The approximate amount of this discharge was 6,000 gallons of potable water caused by a stuck altitude valve on water tank 987. Water flowed into a natural drainage and then entered the Los Alamos Canyon watercourse. On November 30 NMED was notified of a potable water release at Technical Area (TA) 53, Water Tank 987. The release was reported to the Emergency Spill Hotline as required by 20.6.2.1203 NMAC of the Water

Quality Control Commission on December 1. The altitude valve was adjusted and repairs were completed on November 30. No erosion impacts were noted from the release and there were no impacts to any Solid Waste Management Units or Areas of Concern (SWMU/AOC).

Pending spill remediation's are as follows:

- Two of the reports described groundwater spills caused by the accidental loss of pressure of well “packing” devices at R-20 and R-16. Well “packers” are used to isolate ground water between different aquifer zones or screen elevations in a well.
- Three of the reports were notifications for either accidental potable water discharges or the accidental discharge of steam condensate. These spills were reported at TA-16 along Jemez Road, TA-13 Building 40, and TA-18 Building 28. The 7 and 15-day reports are expected by the DOE Oversight Bureau within the week.

Bureau staff collected NPDES outfall samples at two LANL sites. Staff collected samples at the outfalls of EPASSS13S, TA-46 a Sanitary Waste Water Treatment Facility; and EPA051, TA-50 the Radioactive Liquid Waste Treatment Facility (RLWTF). Samples were shipped to ALS Laboratory Group for analysis. Samples from both discharge sites were analyzed for dissolved TAL metals, low level mercury, perchlorate, PCBs (Total and Congeners), major cations (K, Mg, Ca, Na, Si, Sr, and Li), major anions, low background alpha/beta, and tritium. In addition, the RLWTF samples were to be analyzed for radium 226 and 228, isotopic uranium and isotopic americium and strontium-90. The samples will be used by the Bureau to verify that LANS is meeting the NPDES discharge permit requirements.

REGIONAL PCB STUDY PROJECT (LPC13)

Under this Activity ID, Bureau staff conducts a special study to characterize PCB concentrations in stormwater on a regional basis (upper & middle Rio Grande) to put LANL and SNL contributions into the Rio Grande in perspective.

Quarterly Summary: During FFY10 Q-1, Bureau staff continued to collect stormwater samples to determine direct influence and background levels of PCBs in the region around LANL.

In October, Bureau staff collected storm water samples from lower Los Alamos Canyon, the Rio Grande upstream from Los Alamos Canyon and the Rio Grande at the Buckman Direct Diversion. This was the only set of samples collected in 2009 while Los Alamos Canyon stormwater was discharging to the Rio Grande. All other samples were taken from the Rio Grande during events that were not influenced by Los Alamos Canyon flow. Staff continues to compile PCB and USGS gage data from stormwater samples collected at five locations along the Rio Grande

Bureau staff continued to collect precipitation samples from the Los Alamos County airport and Bandelier National Monument. Staff continued to compile precipitation sample PCB data collected near LANL and single stage storm water PCB data collected along tributaries to the Rio Grande and Chama Rivers.



Ralph Ford-Schmid at the Los Alamos County Airport showing a LANL field technician general operating procedures of the precipitation sampler

FISH TISSUE PROJECT (LPC14)

Under this Activity ID, Bureau staff conducts annual sampling of fish tissue in the Rio Grande and reservoirs under a cooperative sampling plan developed with Santa Clara Pueblo. A primary result of this effort is the fish consumption advisory development. During this year, staff participated on the steering committee for the EPA 2007 contaminant in fish forum.

Quarterly Summary: During FFY10 Q-1, there was no activity.

MACROINVERTEBRATE PROJECT (LMI15)

Under this Activity ID, Bureau staff conducts LANL-area stream aquatic community assessment utilizing benthic macro-invertebrate population sampling and assessment methods. Macro-invertebrate populations are a long-term indicator of the chemical, biological and physical health of flowing waters. Density and diversity of species, numbers of individual within taxa, and overall population numbers reflect water quality stressors and/or water quality trends.

Quarterly Summary: During FFY10 Q-1, Bureau staff provided guidance to local pueblo staffs on macroinvertebrate identification and water quality training.

DEMOLITION AND DECOMM PROJECT (LDD16)

Under this Activity ID, Bureau staff conducts site-specific monitoring of air quality downwind from ongoing demolition and decommissioning projects.

Quarterly Summary: During FFY10 Q-1, Bureau staff performed routine maintenance on the solar-powered air monitoring equipment and trailer.

GIS DATA AND REPORTS INFO PROJECT (LGD19)

Under this Activity ID, Bureau staff provides map generation, internal database management and RACER database support.

Quarterly Summary: During FFY10 Q-1, Bureau staff supported other NMED entities and outside agencies with data assessments using RACER, provided mapping assistance and prepared the Invitation to Bid document for selecting services from analytical laboratories.

Bureau staff supported NMED/SWQB and HWB staffs making surface water quality data assessments using the RACER database. Bureau personnel also met with the RACER Project Steering Committee to discuss the status of outstanding issues with the RACER database. The Bureau committed to working through various issues associated with the SWQB Pajarito Plateau dataset that must be resolved before it can be incorporated into the RACER database. The data has a very high priority as it is one of the most comprehensive sets of PCB data collected at LANL and the vicinity. Staff began formatting the SWQB data for inclusion in the RACER database.

Bureau staff completed a table for RACER showing LANS and NMED location identification numbers for co-located monitoring sites. Staff notified RACER and LANS personnel that regional well R-40i was not visible as a location choice. Staff diagnosed significant-figure issues in excel database values for RACER NMED SSL/TWSL entries and made appropriate changes.

Bureau staff researched spring and well locations in Valle Toledo for on-going field activities. Staff cataloged Valles Toledo surveillance photos; produced a map of MDA-C at TA-50 for HWB; produced a map of the WIPP site showing all WIPP Electret locations for their DPR project; updated regional well location maps for R-29, R-30, R-50, R-51, R-52 (new wells that LANL will drill in the near future) and began developing Crystal Reports of all 2008-09 sampling data for submittal to DOE and LANS. After the 30-day review period, all data, with the exception of San I data, will be uploaded into the RACER database.

Bureau staff worked together to update the ALS Lab Price Agreement. Bureau staff, HWB, and LANS personnel hiked to the location of the new well designated R-47 and recorded the GPS coordinates to update a map of all wells and springs. Staff developed an EDD template for C-14 projects and developed a map for the regional PCB project showing the Rio Grande above Alameda stormwater sampling site.

TECHNICAL REVIEW (LMP23)

Under this Activity ID, Bureau staff provides technical support to DOE and LANS, other bureaus in NMED, state and federal entities, and public interest and oversight groups.

Quarterly Summary: During FFY10 Q-1, Bureau staff supported other NMED entities and LANS in assessing canyon flows and cross-vane structural repairs in Pueblo Canyon.

Bureau staff met with HWB, SWQB, LANS and DOE representatives in Pueblo Canyon to observe the cross-vane structures installed in middle Pueblo Canyon. After discussing the structural features, the group came to a consensus for recommended repairs to the structures to meet approved plans and to restore proper function.

Bureau staff met with HWB and SWQB to discuss the base flow modeling for Ancho Canyon. Bureau staff has been observing the flow patterns over a period of 17 years and estimated a flow rate of 20 gpm. This estimate will be used in future calculations based upon observations that Ancho Canyon has had flow measured at the confluence with the Rio Grande for about 13 of the last 15 years. During extreme drought conditions, flow from the springs may not reach the Rio Grande. The same is true for in Frijoles Canyon.

SANDIA NATIONAL LABORATORIES/NEW MEXICO OVERSIGHT

GENERAL ADMINISTRATION (SAD40)

Under this Activity ID, the Bureau manages, administers, and finances the overall activities of staff members in the Albuquerque and Santa Fe office. Staff provides assistance to the Bureau and DOE developing workplans, budgets and training requirements.

Quarterly Summary: During FFY10 Q-1, Bureau staff conducted routine personnel, budget and contract management.

Bureau staff drafted a new Price Agreement to be issued by GSD as an Invitation to Bid (ITB) for laboratory analytical services. The ITB will be issued in February 2010 for execution by mid-April 2010. Several analytical laboratories have gone out of business since the current Price Agreement was executed and it is anticipated that several different laboratories will submit bids for the new Price Agreement.

PUBLIC OUTREACH (SPO41)

Under this Activity ID, Bureau staff interacts with the public through meetings, listening sessions, website development, consultations, and reports.

Quarterly Summary: During FFY10 Q-1, Bureau staff attended the DOE/DoD Semi-Annual Public Meeting in October. Topics included the LTES status and the ER status of projects at SNL/NM.

GENERAL GROUNDWATER MONITORING (ER) (SGE42)

Under this Activity ID, Bureau staff evaluates groundwater parameters to determine whether there is any change in groundwater contamination at SNL and also compares data results from the analytical laboratory used by Sandia to data results obtained by the analytical laboratory used by the Bureau as an independent verification.

Quarterly Summary: During FFY10 Q-1, Bureau staff collected groundwater samples from the following monitoring wells: Chemical Waste Landfill (CWL-MW2BL, CWL-MWL4, CWL-MW5L and CWL-MW6L. Samples were analyzed by a contract analytical laboratory for organics and metals.

Bureau staff continues to participate in monthly groundwater coordination meetings attended by personnel from DOE, SNL, and KAFB.

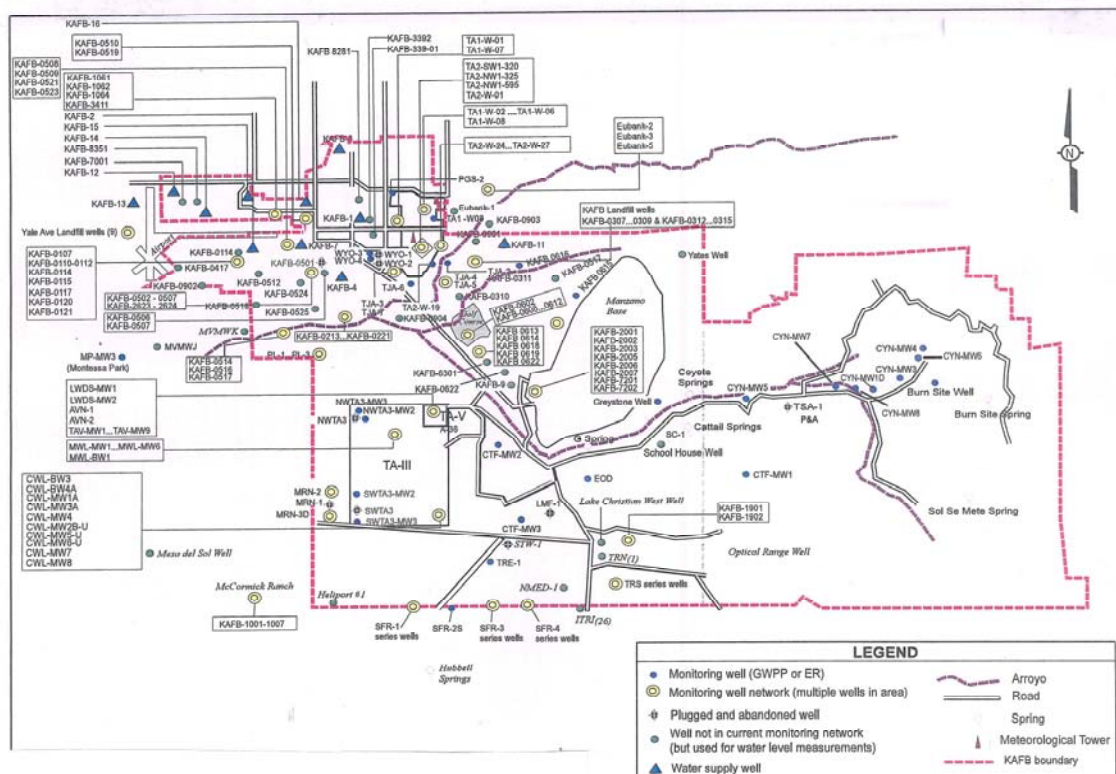


Figure SGE43-1: Map of KAFB with all Wells and Springs (Courtesy of SNL/NM).

Burn Site Groundwater:

Bureau staff submitted a draft data submittal to DOE titled, "Groundwater Monitoring at Sandia National Laboratories/New Mexico Burn Site Conducted by NMED/DOE OB for FFY 2009 Q-4." During September 2009 Bureau staff collected groundwater samples from Burn Site groundwater monitoring wells CYN-MW3, CYN-MW4 and CYN-MW6. Split samples were collected using standard Sandia sampling procedures and equipment. The samples were submitted to a contract laboratory for analyses of metals, inorganic and organic compounds and radionuclides. Nitrate plus nitrite (NPN) was detected above the MCL of 10 mg/L at monitoring wells CYN-MW3 and CYN-MW6. Corrected gross alpha (total gross alpha activity excluding total uranium activity) was detected above the MCL of 15 pCi/L at monitoring well CYN-MW4. A final report will be available after review by DOE.

Nitrate plus nitrite concentrations at CYN-MW3 during fourth quarter compare well with historical Sandia data. Based on this historical trend, NPN concentrations at CYN-MW3 have been steady to slightly decreasing over time. Nitrate concentrations from CYN-MW6 have consistently exceeded the MCL of 10 mg/L. The NPN data from CYN-MW6 show a strong

increase over the years and concentrations have been slightly higher than those indicated from the Sandia data. Historical data from Sandia (2006-2008) indicate NPN concentrations have been steady to slightly increasing over time. Gross alpha activity from CYN-MW4 exceeded the MCL of 15 pCi/L. Results obtained by NMED compare well to historical Sandia gross alpha activities.

Groundwater Protection Program (GWPP):

Bureau staff had no activity to report for this quarter.

Mixed Waste Landfill Groundwater:

Bureau staff finalized the draft data submittal titled, "Groundwater Monitoring at Sandia National Laboratories/New Mexico Mixed Waste Landfill Conducted by NMED/DOE OB for FFY 2009 Q-2."

Bureau staff finalized a draft data submittal titled, "Groundwater Monitoring at Sandia National Laboratories/New Mexico Mixed Waste Landfill Conducted by NMED/DOE OB for FFY 2009 Q-3."

Bureau staff finalized a draft data submittal titled, "Groundwater Monitoring at Sandia National Laboratories/New Mexico Mixed Waste Landfill Conducted by NMED/DOE OB for FFY 2009 Q-4."

All final reports will be available after review by DOE.

Technical Area-V (TA-V) Groundwater:

Bureau staff created data tables, trending graphs and drafted a data submittal for Technical Area-V Groundwater Monitoring for Q-4 FY09. Bureau required the analytical laboratory to re-run two samples for NPN analysis because the concentration values obtained by the laboratory were higher than Sandia historical concentrations. A draft data submittal will be delivered to DOE during FFY 2010 Q-2.

Tijeras Arroyo Groundwater (TAG):

Bureau staff submitted a draft data submittal for review to DOE titled, "Groundwater Monitoring at Sandia National Laboratories/New Mexico Tijeras Arroyo Conducted by NMED/DOE OB for FFY 2009 Q-4, October 8, 2009." During July/August 2009 Bureau staff collected groundwater samples from Tijeras Arroyo Groundwater (TAG) monitoring wells TA2-NW1-595, TA2-SW1-320, TA2-W-19, TA2-W-27, TJA-2, TJA-3, TJA-4, TJA-6, TJA-7, and WYO-4. Split samples were collected using standard Sandia sampling procedures and equipment. Bureau samples were submitted to a contract laboratory for analyses of metals, inorganic and organic compounds, and radionuclides. Nitrate plus nitrite was detected above the 10 mg/L EPA Maximum Contaminant Level (MCL) at monitoring wells: TA2-SW1-320 (23 mg/L), TA2-W-19 (10 mg/L), TJA-2 (13 mg/L), TJA-4 (35 mg/L), and TJA-7 (30 mg/L). The trichloroethylene (TCE) concentration at WYO-4 (6.9 µg/L) exceeded the EPA MCL of 5 µg/L. A final report will be available after review by DOE.

Chemical Waste Landfill (CWL) Groundwater:

On October 15, 2009, the NMED signed a Final Order to issue a final Post-Closure Care Permit for the CWL. On October 16, 2009, the NMED approved the final remedy and Closure Plan Amendment for the CWL. The Final Order, the Closure Plan Amendment as Changed, and the final Permit and response to comments can be viewed on the NMED webpage at <http://www.nmenv.state.nm.us/hwb/snlperm.html>.

DIRECT PENETRATING RADIATION PROJECT (SDP43)

Under this Activity ID, Bureau staff uses Electret passive ion chambers to evaluate the ambient gamma radiation at SNL. The Electret passive ion chamber functions on the principle of ion pair production resulting from gamma photons interacting with air molecules within an air-vented ("S" type) chamber of predetermined volume to reduce the voltage of a charged Teflon™ disk. The voltage drop is proportional to the amount of gamma photons passing through the chamber. By using the change in voltage, a dose in units of milliRem (mrem) at a particular location can be determined with the use of a proprietary software algorithm.

Quarterly Summary: During FFY10 Q-1, Bureau staff conducted direct penetrating radiation measurements from all 12 Electret stations located on-site and off-site. Results will be compared with Sandia data and reported to DOE.

Bureau staff drafted a data submittal for review to DOE titled, "Direct Penetrating Radiation Monitoring at Sandia National Laboratories/New Mexico Conducted by NMED/DOE OB for CY 2009 Q-3." A final report will be available after review by DOE.

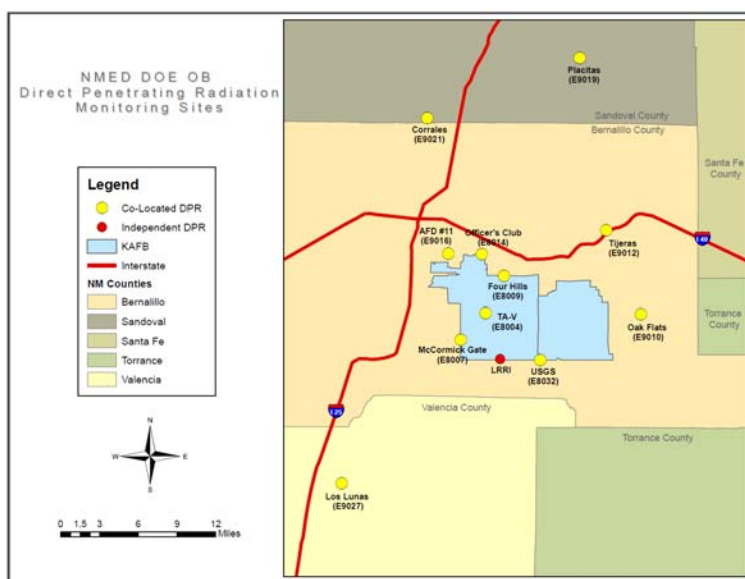


Figure SDP43-1: The yellow dots depict sites co-located with Sandia, and the red dot depicts an independent monitoring site.

PARTICULATES LOW-VOLUME AIR PROJECT (SPL44)

Under this Activity ID, Bureau staff evaluates the ambient air concentrations of gross alpha/beta, isotopic americium, isotopic plutonium, isotopic uranium, gamma-emitting isotopes, and tritium at the SNL. The Bureau operates air monitoring stations to collect airborne particulate matter and water vapor at SNL using NMED sampling protocols and procedures. Air particulate matter

consists of minute “dust” particles collected on a polypropylene particulate filter. Water vapor is collected by passing a known volume of air through a silica gel-filled cartridge, a hydrophilic compound that traps ambient air moisture.

Quarterly Summary: During FFY10 Q-1, Bureau staff continued to collect bi-weekly air particulate filters from 3 perimeter monitoring stations and 1 station located at the Mixed Waste Landfill. In addition to collecting particulate filters, the Bureau collects silica gel samples. Silica gel samples taken from perimeter stations are collected bi-weekly, and they are composited for the quarter. Silica gel samples taken from MWL are also collected bi-weekly, but they are not composited.

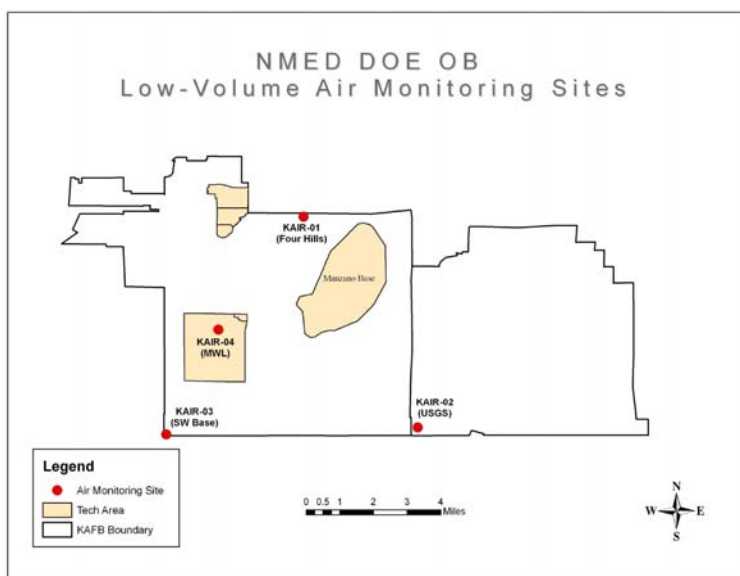


Figure SPL44-1: Location of three perimeter and one MWL low-volume air monitoring stations.

Bureau staff shipped third calendar quarter 2009 samples to a contract laboratory for analyses. Particulate filters will be analyzed for gross alpha/beta, gamma-emitting isotopes, and isotopic americium, plutonium and uranium. Silica gel samples will be analyzed for the presence of tritium.

Bureau staff shipped the Digital Air Flow calibrator to Hi-Q laboratory for annual calibration.

Bureau staff drafted two (quarterly) data submittals for review to DOE titled:

- “Airborne Particulate Radiation and Atmospheric Tritium Results at Sandia National Laboratories/New Mexico, Conducted by NMED/DOE OB for CY 2009 Q-2.”
- “Airborne Particulate Radiation and Atmospheric Tritium Results at Sandia National Laboratories/New Mexico, Conducted by NMED/DOE OB for CY 2009 Q-3.”

All measured values, including those above minimum detectable activities, were significantly below NESHAP and DOE concentration standards. Final reports will be available after review by DOE.

STORMWATER PROJECT (SSW45)

Under this Activity ID, Bureau staff conducts stormwater monitoring at stations generally co-located with Sandia monitoring stations down gradient from Areas of Concern or Solid Waste Management Units.

Quarterly Summary: During FFY10 Q-1, Bureau staff completed data tables and reports for 6 sampling events.

Bureau staff completed data tables and reports for stormwater events 3, 4, 5, 6, 7, and 8. All samples were submitted to independent analytical laboratories for various analyses from the following list; TAL dissolved metals, gross alpha/beta (filtered & unfiltered), gamma-emitting isotopes, tritium, isotopic uranium, perchlorate, high explosive compounds, nitrate/nitrite, volatile organic compounds, gasoline range organics, diesel range organics, SSC, and particle size distribution. Data results are compared to applicable *Standards for Interstate and Intrastate Surface Waters* for Livestock Watering, Wildlife Habitat, Aquatic Life (acute), and Human Health criteria from the New Mexico Water Quality Control Commission (WQCC) (20.6.4 NMAC).

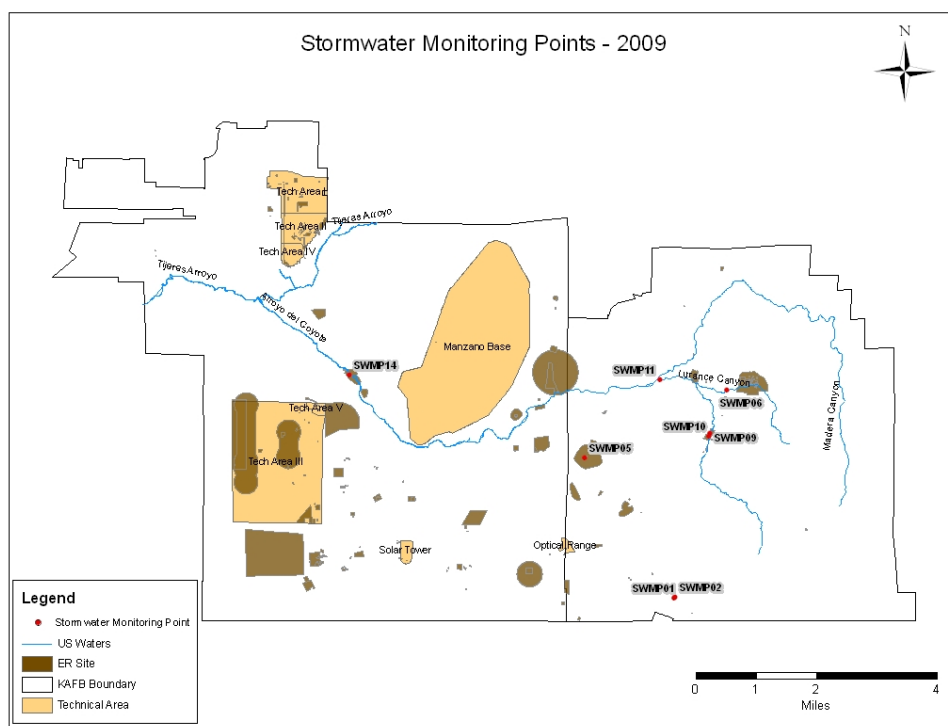


Figure SSW45-1: Map of stormwater monitoring sites.

The Bureau collected an independent stormwater sample from SWMP-10 during the week of March 10, 2009 (stormwater event 3). No analytes exceeded established criteria.

The Bureau collected an independent stormwater sample from SWMP-10 during the week of April 13, 2009 (stormwater event 4). Copper exceeded the AAL criteria of 0.0094 mg/L with a concentration of 0.0106 mg/L. Adjusted gross alpha activity was 22.41 pCi/L, exceeding the LW criteria of 15 pCi/L. No other analytes exceeded established criteria.

The Bureau collected an independent stormwater sample from SWMP-10 during the week of June 17, 2009 (stormwater event 5). No analytes exceeded established criteria.

The Bureau collected independent storm water samples from SWMP-02 and SWMP-06 during the week of July 22, 2009 (stormwater event 6). Zinc exceeded the AAL criteria of 0.115 mg/L with a concentration of 0.16 mg/L for SWMP-02. Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 2.6 mg/L for SWMP-06. Unfiltered gross alpha activity was 120 pCi/L at SWMP-02 and 52 pCi/L at SWMP-06. The activities were not corrected for uranium concentrations. The LW criterion is 15 pCi/L. No other analytes exceeded established criteria.

The Bureau collected an independent stormwater sample from SWMP-02 during the week of September 10, 2009 (stormwater event 7). Unfiltered gross alpha activity was 290 pCi/L and the filtered activity was 1.3 pCi/L. All activities were uncorrected for uranium concentrations. The LW criterion for adjusted gross alpha is 15 pCi/L. No other analytes exceeded established criteria.

The Bureau collected independent stormwater samples from SWMP-01 and SWMP-05, during the week of September 17, 2009, and SWMP-05 and SWMP-14 during the week of September 21, 2009 (stormwater event 8). Unfiltered gross alpha activity was 110 pCi/L and filtered activity was 4.5 pCi/L at SWMP-01. Unfiltered activity was 14 pCi/L and filtered activity was 1.1 pCi/L at SWMP-05 (17th of September). Unfiltered activity was 25 pCi/L and filtered activity was 0.67 pCi/L at SWMP-05. Unfiltered activity was 58 pCi/L and filtered activity was 2 pCi/L at SWMP-14 (21st September). All activities were uncorrected for uranium concentrations. No other analytes exceeded established criteria.

Date	Location	Gross Alpha Unfiltered (pCi/L)	Adjusted Gross Alpha (pCi/L)	Gross Alpha Filtered (pCi/L)	Rainfall (inches)	Particle Size (%)	Particle Size (mm)	SSC (mg/L)	TDS (mg/L)
10-Mar-09	SWMP-10	1.52	0.52	NA	NA	NA	NA	0.28	NA
13-Apr-09	SWMP-10	23.95	22.41	NA	NA	NA	NA	1.04	NA
17-Jun-09	SWMP-10	1.76	0.98	13.195	0.02	10.5	0.002-0.003	NA	NA
22-Jul-09	SWMP-02	120	NA	1.1	0.72	9.8	0.002-0.003	6400	NA
22-Jul-09	SWMP-06	52	NA	1.5	0.72	11.8	0.002-0.003	5500	NA
10-Sep-09	SWMP-02	290	NA	1.3	1.1	NA	NA	13000	260
17-Sep-09	SWMP-01	110	NA	4.5	NA	NA	NA	3800	260
17-Sep-09	SWMP-05	14	NA	1.1	0.15	NA	NA	590	100
21-Sep-09	SWMP-05	25	NA	0.67	1.41	NA	NA	950	280
21-Sep-09	SWMP-14	58	NA	2	1.0	NA	NA	2800	180

Figure SSW45-2: The data presented in this Table suggest a weak correlation between the amount of rainfall per event, the amount of suspended sediment concentrations in each sample, and the elevated unfiltered gross alpha activities. Additional data will be required to establish this trend.

Finalized reports for each of these events are being drafted.

Bureau staff collected stormwater samples from SWMP-01 and SWMP-05 during the week of October 21, 2009. Analytical results are pending.

TIJERAS ARROYO STUDY (STA47)

Under this Activity ID, Bureau staff conducts stormwater monitoring by collecting samples from single-stage, one-gallon containers located down gradient from Areas of Concern or Solid Waste Management Units along the Tijeras Arroyo.

Quarterly Summary: During FFY10 Q-1, Bureau staff completed data tables and reports for 11 sampling events, including two for sediment analysis, one for soil analysis, and eight for stormwater analysis.

Bureau staff completed data tables and reports for Tijeras Arroyo sediment sampling events 2 and 3 and soil sampling event 4. All samples were submitted to an independent analytical laboratory for various analyses from the following list: Target Analyte List (TAL) total metals, gross alpha/beta, gamma-emitting isotopes, tritium, isotopic uranium, isotopic plutonium, perchlorate, high explosive compounds, nitrate/nitrite, volatile organic compounds, semi-volatile organic compounds, diesel range organics, polychlorinated biphenyls (PCBs), suspended sediment concentration (SSC), and particle size distribution. Data results are compared to applicable soil screening levels found in Appendix A of the NMED Technical Background Document For Development of Soil Screening Levels, August 2009, Revision 5; and Tables 1 and 2 of the Hazardous and Radioactive Materials Bureau Background Concentrations of Constituents of Concern to the Sandia National Laboratories/New Mexico Environmental Restoration Project and the Kirtland Air Force Base Installation Restoration Program, Revised September 1997.

The Bureau collected fifteen independent sediment samples from the active channel in Tijeras Arroyo, TA-A-001 to TA-A-011 and TA-A-013 to TA-A-016 during the weeks of March 18, 2009 and April 7, 2009 (sediment event 2 & 3). Thorium-234 exceeded the screening level of 2.3 pCi/g at two locations; TA-A-007 with an activity of 2.487 pCi/g and TA-A-010 with an activity of 3.503 pCi/g. No other analytes exceeded established screening or background levels.

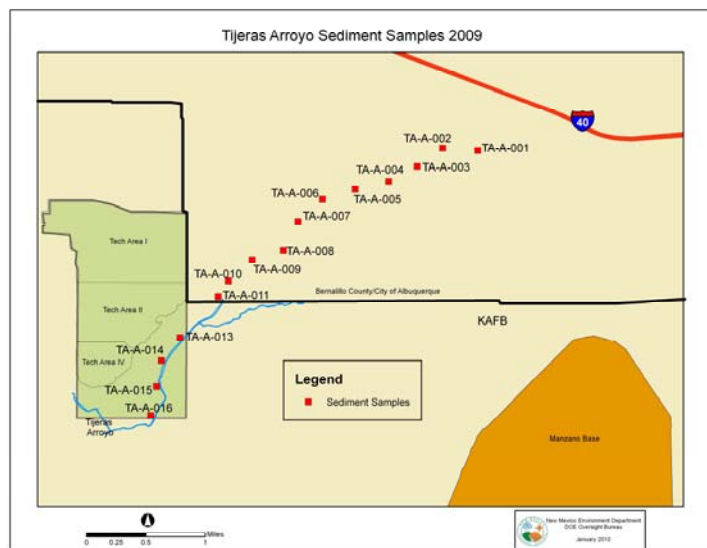


Figure STA47-1: A Map of Tijeras Arroyo sediment sampling sites above the northern border of KAFB and within the technical areas of SNL/NM.

The Bureau collected six independent soil samples along the northern rim of Tijeras Arroyo, TA-S-001 to TA-S-006, during the week of June 3, 2009 (soil event 4). Four analytes exceeded the background levels at some or all six sampling locations, as highlighted in Figure STA47-2 below. No other analytes exceeded established screening or background levels.

Analyte	Background Level, mg/L	S-001 mg/L	S-002 mg/L	S-003 mg/L	S-004 mg/L	S-005 mg/L	S-006 mg/L
Chromium	21.8		23.2				
Selenium	<1	3.41	14.8	8.33	3.04	6.79	6.5
Thallium	<1.1	1.31	1.34	1.37	1.31	1.35	1.31
Vanadium	33		100	36.1			79.4

Figure STA47-2: Analyte concentrations found above background at six soil sample sites in Tijeras Arroyo.

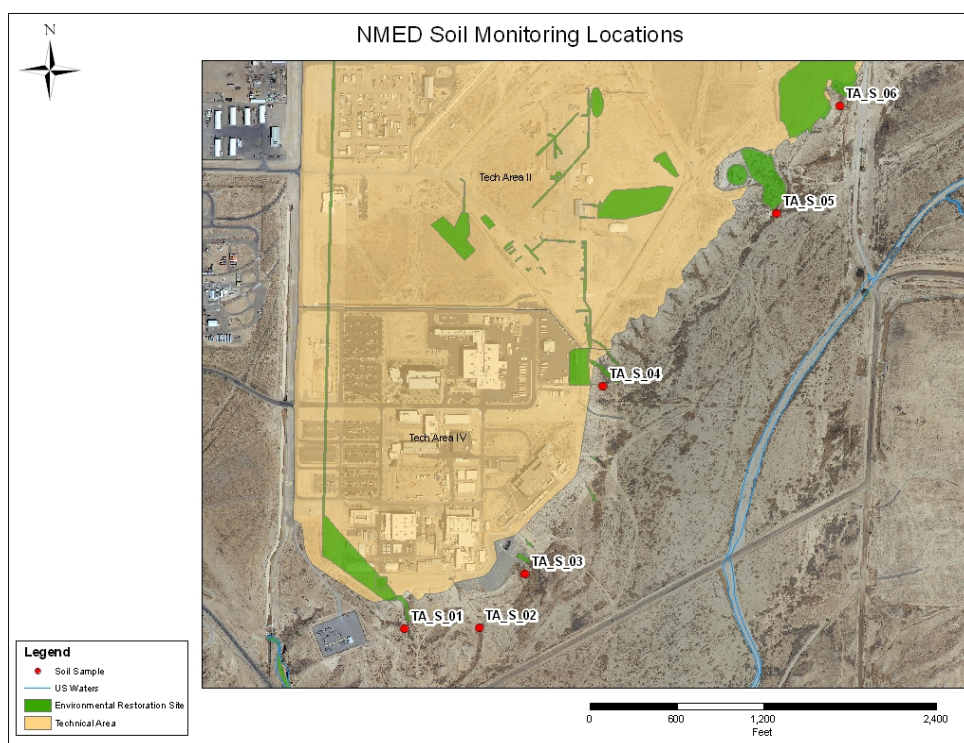


Figure STA47-3: A map of Tijeras Arroyo soil sampling sites.

Bureau staff completed data tables and reports for Tijeras Arroyo stormwater events 5, 6, 7, 8, 9, 10, 11, and 12. All samples were submitted to independent analytical laboratories for various analyses from the following list; TAL dissolved metals, gross alpha/beta (filtered & unfiltered), gamma-emitting isotopes, tritium, perchlorate, high explosive compounds, nitrate/nitrite, volatile organic compounds, gasoline range organics, diesel range organics, SSC, and particle size distribution. Data results are compared to applicable *Standards for Interstate and Intrastate Surface Waters* for Livestock Watering, Wildlife Habitat, Aquatic Life (acute), and Human Health criteria from the New Mexico Water Quality Control Commission (WQCC) (20.6.4 NMAC).

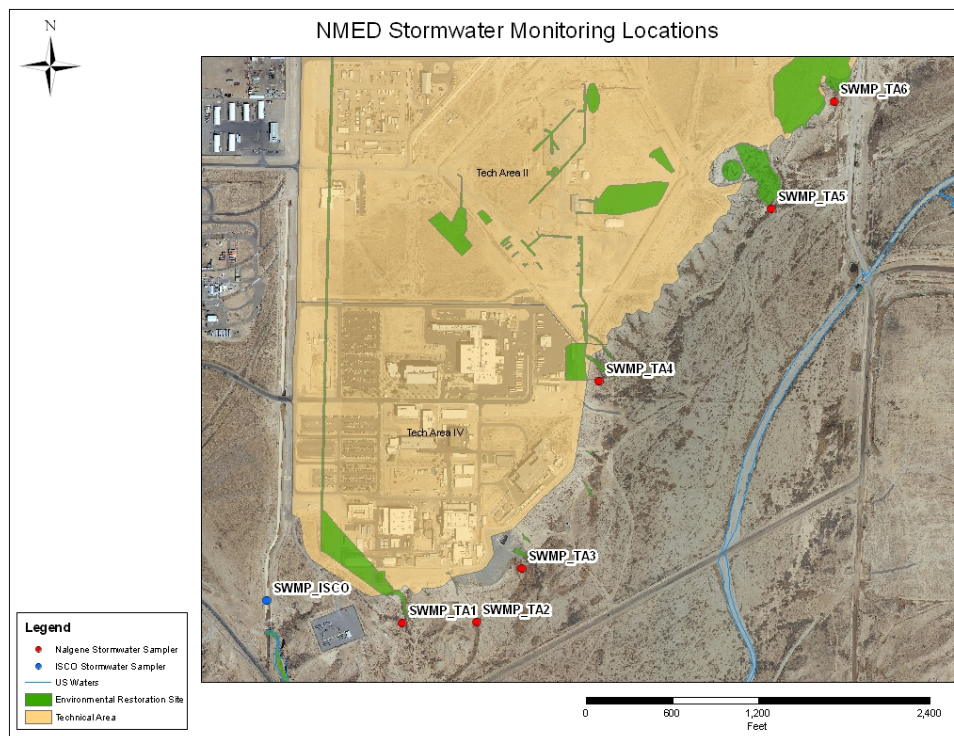


Figure STA47-4: A map of Tijeras Arroyo stormwater sampling sites.

The Bureau collected independent stormwater samples from SWMP-TA2 and SWMP-TA3 during the week of June 10, 2009 (stormwater event 5). Aluminum exceeded the Acute Aquatic Life (AAL) criteria of 0.75 mg/L with a concentration of 2.67 mg/L, Copper exceeded the AAL criteria of 0.0133 mg/L with a concentration of 0.0303 mg/L at SWMP-TA2. Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 5.33 mg/L, Arsenic exceeded the Human Health (HH) criteria of 0.009 mg/L with a concentration of 0.0218 mg/L, Copper exceeded the AAL criteria of 0.0182 mg/L with a concentration of 0.0336 mg/L, and Zinc exceeded the AAL criteria of 0.154 mg/L with a concentration of 0.174 mg/L at SWMP-TA3. No other analytes exceeded established criteria.

The Bureau collected independent stormwater samples from SWMP-TA2 and SWMP-TA3 during the week of July 2, 2009 (stormwater event 6). Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 1.76 mg/L, Arsenic exceeded the HH criteria of 0.009 mg/L with a concentration of 0.092 mg/L, Copper exceeded the AAL criteria of 0.0164 mg/L with a concentration of 0.0312 mg/L, and Zinc exceeded the AAL criteria of 0.14 mg/L with a concentration of 0.181 mg/L at SWMP-TA2. Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 2.01 mg/L, Arsenic exceeded the Human Health (HH) criteria of 0.009 mg/L with a concentration of 0.0956 mg/L, Cadmium exceeded the AAL criteria of 0.0026 mg/L with a concentration of 0.00588 mg/L, Copper exceeded the AAL criteria of 0.0171 mg/L with a concentration of 0.0235 mg/L, and Zinc exceeded the AAL criteria of 0.145 mg/L with a concentration of 0.262 mg/L at SWMP-TA3. No other analytes exceeded established criteria.

The Bureau collected independent stormwater samples from SWMP-TA2 and SWMP-TA3 during the week of July 6, 2009 (stormwater event 7). Aluminum exceeded the AAL criteria of 0.75 mg/L

with a concentration of 7.03 mg/L, Arsenic exceeded the HH criteria of 0.009 mg/L with a concentration of 0.0119 mg/L, Copper exceeded the AAL criteria of 0.0198 mg/L with a concentration of 0.0398 mg/L, and Zinc exceeded the AAL criteria of 0.166 mg/L with a concentration of 0.257 mg/L at SWMP-TA2. Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 6.97 mg/L, Arsenic exceeded the HH criteria of 0.009 mg/L with a concentration of 0.0441 mg/L, Cadmium exceeded the AAL criteria of 0.0027 mg/L with a concentration of 0.00715 mg/L, Copper exceeded the AAL criteria of 0.0176 mg/L with a concentration of 0.0364 mg/L, and Zinc exceeded the AAL criteria of 0.149 mg/L with a concentration of 0.346 mg/L at SWMP-TA3. No other analytes exceeded established criteria.

The Bureau collected independent storm water samples from SWMP-TA2 and SWMP-TA3 during the week of July 22, 2009 (stormwater event 8). Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 4.1 mg/L for SWMP-TA2. SWMP-TA3 had four metals exceed water quality criteria. Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 6.9 mg/L. Arsenic exceeded the HH criteria of 0.009 mg/L with a concentration of 0.015 mg/L. Copper exceeded the AAL criteria of 0.0292 mg/L with a concentration of 0.11 mg/L. Zinc exceeded the AAL criteria of 0.235 mg/L with a concentration of 0.63 mg/L. No other analytes exceeded established criteria.

The Bureau collected an independent storm water sample from SWMP-ISCO-TA during the week of August 11, 2009 (stormwater event 9). Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 18 mg/L. Arsenic exceeded the HH criteria of 0.009 mg/L with a concentration of 0.011 mg/L. Copper exceeded the AAL criteria of 0.034 mg/L with a concentration of 0.039 mg/L. Zinc exceeded the AAL criteria of 0.270 mg/L with a concentration of 0.34 mg/L. Unfiltered gross alpha activity was 21 pCi/L and the filtered value was 3.2 pCi/L. All values were uncorrected for uranium and radon concentrations. The Livestock Watering (LW) criterion for adjusted gross alpha is 15 pCi/L (adjusted gross alpha activity is calculated by subtracting the activities of radon-222 and all isotopes of uranium and any special nuclear materials, but during the analysis of gross alpha, radon-222 is lost by virtue of the preparation method. As a result, isotopic uranium is used for adjustment of gross alpha activity). No other analytes exceeded established criteria.

The Bureau collected independent storm water samples from SWMP-ISCO-TA, SWMP-TA2, & SWMP-TA3 during the week of August 17, 2009 (stormwater event 10). Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 1.1 mg/L at SWMP-ISCO-TA, 8.7 mg/L at SWMP-TA2, and 6.4 mg/L at SWMP-TA3. Arsenic exceeded the HH criteria of 0.009 mg/L with a concentration of 0.015 mg/L at SWMP-ISCO-TA, 0.012 mg/L at SWMP-TA2, and 0.075 mg/L at SWMP-TA3. Cadmium exceeded the AAL criteria of 0.0036 mg/L with a concentration of 0.014 mg/L at SWMP-TA3. Copper exceeded the AAL criteria of 0.0321 mg/L with a concentration of 0.047 mg/L at SWMP-TA2. Copper exceeded the AAL criteria of 0.0239 mg/L with a concentration of 0.059 mg/L at SWMP-TA3. Zinc exceeded the AAL criteria of 0.256 mg/L with a concentration of 0.30 mg/L at SWMP-TA2. Zinc exceeded the AAL criteria of 0.197 mg/L with a concentration of 0.49 mg/L at SWMP-TA3. No other analytes exceeded established criteria.

The Bureau collected an independent storm water sample from SWMP-ISCO-TA during the week of August 24, 2009 (stormwater event 11). Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 9.3 mg/L. Copper exceeded the AAL criteria of 0.0185 mg/L with a concentration of 0.023 mg/L. Zinc exceeded the AAL criteria of 0.156 mg/L with a concentration of 0.40 mg/L. Unfiltered gross alpha activity was 17 pCi/L and the filtered value was 0.89 pCi/L. All values were uncorrected for uranium concentrations. The LW criterion for adjusted gross alpha is 15 pCi/L. No other analytes exceeded established criteria.

The Bureau collected independent stormwater samples from SWMP-TA2, SWMP-TA3, SWMP-TA5, and SWMP-TA6 during the weeks of September 10, 2009 and September 21, 2009 (stormwater event 12). Two samples were collected on the 10th at SWMP-TA2 and SWMP-TA3. Four samples were collected on the 21st at SWMP-TA2, SWMP-TA3, SWMP-TA5, and SWMP-TA6. Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 1.6 mg/L, Copper exceeded the AAL criteria of 0.0117 mg/L with a concentration of 0.012 mg/L, and Zinc exceeded the AAL criteria of 0.103 mg/L with a concentration of 0.12 mg/L at SWMP-TA2 (September 10th). Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 2.4 mg/L, Arsenic exceeded the HH criteria of 0.009 mg/L with a concentration of 0.046 mg/L, Copper exceeded the AAL criteria of 0.0093 mg/L with a concentration of 0.014 mg/L, and Zinc exceeded the AAL criteria of 0.082 mg/L with a concentration of 0.13 mg/L at SWMP-TA3 (September 10th). Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 25 mg/L, Arsenic exceeded the HH criteria of 0.009 mg/L with a concentration of 0.013 mg/L, Copper exceeded the AAL criteria of 0.0496 mg/L with a concentration of 0.069 mg/L, and Zinc exceeded the AAL criteria of 0.379 mg/L with a concentration of 0.39 mg/L at SWMP-TA2 (September 21st). Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 3.6 mg/L, Arsenic exceeded the HH criteria of 0.009 mg/L with a concentration of 0.061 mg/L, Cadmium exceeded the AAL criteria of 0.002 mg/L with a concentration of 0.0067 mg/L, Copper exceeded the AAL criteria of 0.0134 mg/L with a concentration of 0.026 mg/L, and Zinc exceeded the AAL criteria of 0.117 mg/L with a concentration of 0.25 mg/L at SWMP-TA3 (September 21st). Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 45 mg/L and Arsenic exceeded the HH criteria of 0.009 mg/L with a concentration of 0.015 mg/L at SWMP-TA5 (September 21st). Aluminum exceeded the AAL criteria of 0.75 mg/L with a concentration of 110 mg/L, Arsenic exceeded the HH criteria of 0.009 mg/L with a concentration of 0.046 mg/L, Copper exceeded the AAL criteria of 0.0496 mg/L with a concentration of 0.13 mg/L, Vanadium exceeded the Livestock Watering (LW) criteria of 0.1 mg/L with a concentration of 0.23 mg/L, and Zinc exceeded the AAL criteria of 0.379 mg/L with a concentration of 0.41 mg/L at SWMP-TA6 (September 21st).

Unfiltered gross alpha activity was 61 pCi/L and filtered gross alpha activity was 0.91 pCi/L at SWMP-TA2 (September 21st). Unfiltered gross alpha activity was 49 pCi/L and filtered gross alpha activity was 0.82 pCi/L at SWMP-TA5 (September 21st). Unfiltered gross alpha activity was 140 pCi/L and filtered gross alpha activity was 1.6 pCi/L at SWMP-TA6 (September 21st). All gross alpha values were measured as total activities, including uranium, radon-222 and special nuclear materials, if any. The LW criterion for adjusted gross alpha is 15 pCi/L. No other analytes exceeded established criteria.

Date	Location	Gross Alpha Unfiltered (pCi/L)	Gross Alpha Filtered (pCi/L)	Rainfall (inches)	Particle Size (%)	Particle Size (mm)	SSC (mg/L)	TDS (mg/L)
06/10/09	SWMP-TA2	U	2.07	0.32	8.2	0.15-0.20	NA	NA
07/02/09	SWMP-TA2	4.79	10.94	0.05	8.9	0.02-0.03	NA	NA
07/06/09	SWMP-TA2	U	2.08	0.46	8.9	0.02-0.03	NA	NA
07/22/09	SWMP-TA2	6.9	2.3	0.15	9.5	0.02-0.03	300	NA
08/17/09	SWMP-TA2	11	1.7	0.24	8.0	0.02-0.03	1600	NA
09/10/09	SWMP-TA2	2.7	0.71	0.15	NA	NA	21	190
09/21/09	SWMP-TA2	61	0.91	0.55	NA	NA	4800	210

Figure STA47-5: Tijeras Arroyo Stormwater Gross Alpha, Rainfall, Particle Size, SSC, and TDS Data from samples collected at Monitoring Point TA2

Stormwater monitoring point TA2 was sampled seven times during the fiscal year. The first three samples collected were analyzed by ARSA Analytical Laboratory and the remaining samples were analyzed by ALS Analytical Laboratory. Only one sample, September 21, 2009, exceeded the LW criteria of 15 pCi/L with an activity of 61 pCi/L. The activity is uncorrected for uranium concentrations. The samples analyzed by ARSA demonstrate higher gross alpha activities after filtration, whereas the samples analyzed by ALS have higher unfiltered gross alpha activities. The final sample collected had an unfiltered gross alpha activity of 61 pCi/L and a filtered activity of 0.91 pCi/L to suggest the activity in the sample was associated with the particulates. The September 21st sampling event also had the greatest amount of precipitation and the highest suspended sediment concentration (4800 mg/L).

Date	Location	Gross Alpha Unfiltered (pCi/L)	Gross Alpha Filtered (pCi/L)	Rainfall (inches)	Particle Size (%)	Particle Size (mm)	SSC (mg/L)	TDS (mg/L)
06/10/09	SWMP-TA3	3.72	4.48	0.32	13.3	0.075-0.100	NA	NA
07/02/09	SWMP-TA3	2.36	3.16	0.05	13.3	0.075-0.100	NA	NA
07/06/09	SWMP-TA3	1.83	U	0.46	13.3	0.075-0.100	NA	NA
07/22/09	SWMP-TA3	8.50	2.4	0.15	7.2	0.002-0.003	450	NA
08/17/09	SWMP-TA3	12.0	1.5	0.24	9.1	0.02-0.03	120	NA
09/10/09	SWMP-TA3	4.0	0.65	0.15	NA	NA	92	120
09/21/09	SWMP-TA3	11.0	2.4	0.55	NA	NA	560	210

Figure STA47-6: Tijeras Arroyo Stormwater Gross Alpha, Rainfall, Particle Size, SSC, and TDS Data from samples collected at Monitoring Point TA3.

Stormwater monitoring point TA3 was sampled seven times during the fiscal year. Although two different analytical laboratories provided analyses from the different sampling events, all concentrations were below the gross alpha LW criteria of 15 pCi/L. However, as noted in figures -5 and -6, the concentration levels are reversed for filtered and unfiltered samples between the two laboratories. The samples analyzed by ARSA demonstrate higher gross alpha activities after filtration, whereas the samples analyzed by ALS have higher unfiltered gross alpha activities.

Date	Location	Gross Alpha Unfiltered (pCi/L)	Gross Alpha Filtered (pCi/L)	Rainfall (inches)	Particle Size (%)	Particle Size (mm)	SSC (mg/L)	TDS (mg/L)
08/11/09	SWMP-ISCO-TA	21	3.2	0.07	9.1	0.002-0.003	840	NA
08/17/09	SWMP-ISCO-TA	7.1	3.5	0.24	9.6	0.02-0.03	20	NA
08/24/09	SWMP-ISCO-TA	17	0.89	0.41	NA	NA	170	120
09/21/09	SWMP-TA5	49	0.82	0.55	NA	NA	2300	210
09/21/09	SWMP-TA6	140	1.6	0.55	NA	NA	8600	280

Figure STA47-7: Tijeras Arroyo Stormwater Gross Alpha, Rainfall, Particle Size, SSC, and TDS Data from samples collected at Monitoring Point ISCO-TA, TA5, & TA6.

Stormwater monitoring point ISCO-TA was sampled three times and TA5 and TA6 were sampled once each during the fiscal year. All samples were analyzed by a contract laboratory. Four out of five samples exceeded the adjusted gross alpha LW criteria of 15 pCi/L, but all activities are uncorrected for uranium concentrations. Two of the three samples collected with the ISCO station have uncorrected activities exceeding the LW criteria and these samples have higher suspended sediment concentrations. Samples collected at SWMP-TA5 and SWMP-TA6 have greater concentrations of suspended sediments along with elevated gross alpha activities.

Date	Location	Analyte	Result	Analyte	Result	Analyte	Result	Analyte	Result	Analyte	Result	Analyte	Result
06/10/09	TA2	Al	2.67	As	NA	Cd	NA	Cu	0.03	V	NA	Zn	NA
07/02/09	TA2	Al	1.76	As	0.009	Cd	NA	Cu	0.031	V	NA	Zn	0.18
07/06/09	TA2	Al	7.03	As	0.012	Cd	NA	Cu	0.04	V	NA	Zn	0.26
07/22/09	TA2	Al	4.1	As	NA	Cd	NA	Cu	NA	V	NA	Zn	NA
08/17/09	TA2	Al	8.7	As	0.012	Cd	NA	Cu	0.047	V	NA	Zn	0.3
09/10/09	TA2	Al	1.6	As	NA	Cd	NA	Cu	0.012	V	NA	Zn	0.12
09/21/09	TA2	Al	25	As	0.013	Cd	NA	Cu	0.069	V	NA	Zn	0.39
06/10/09	TA3	Al	5.33	As	0.022	Cd	NA	Cu	0.034	V	NA	Zn	0.17
07/02/09	TA3	Al	2.01	As	0.096	Cd	0.0059	Cu	0.024	V	NA	Zn	0.26
07/06/09	TA3	Al	6.97	As	0.044	Cd	0.0072	Cu	0.036	V	NA	Zn	0.35
07/22/09	TA3	Al	6.9	As	0.015	Cd	NA	Cu	0.11	V	NA	Zn	0.63
08/17/09	TA3	Al	6.4	As	0.075	Cd	0.014	Cu	0.059	V	NA	Zn	0.49
09/10/09	TA3	Al	2.4	As	0.046	Cd	NA	Cu	0.014	V	NA	Zn	0.13
09/21/09	TA3	Al	3.6	As	0.061	Cd	0.0067	Cu	0.026	V	NA	Zn	0.25
08/11/09	ISCO	Al	18	As	0.011	Cd	NA	Cu	0.039	V	NA	Zn	0.34
08/17/09	ISCO	Al	1.1	As	0.015	Cd	NA	Cu	NA	V	NA	Zn	NA
08/24/09	ISCO	Al	9.3	As	NA	Cd	NA	Cu	0.023	V	NA	Zn	0.4
09/21/09	TA5	Al	45	As	0.015	Cd	NA	Cu	NA	V	NA	Zn	NA
09/21/09	TA6	Al	110	As	0.046	Cd	NA	Cu	0.13	V	0.23	Zn	0.41

Figure STA47-8: Tijeras Arroyo Stormwater Metals Data from samples collected at Monitoring Point TA2, TA3, TA5, TA6, & ISCO-TA.

The above table depicts the AAL and HH criteria exceedances for aluminum, arsenic, cadmium, copper, vanadium, and zinc. Bureau staff collected stormwater samples from SWMP-TA2, SWMP-TA3, and SWMP-TA6 during the week of October 21, 2009 and again during the week of October 29, 2009. Analytical results are pending.

DEMOLITION AND DECOMMISSIONING PROJECT (SDD48)

Under this Activity ID, Bureau staff conducts site evaluations and media monitoring during decommissioning and demolition operations.

Quarterly Summary: During FFY10 Q-1, no activity was reported during this period.

BIOTA AND TERRESTRIAL PROJECT (STE49)

Under this Activity ID, Bureau staff conducts annual sampling of soils and plants in a cooperative effort with Sandia on KAFB and the surrounding area.

Quarterly Summary: During FFY10 Q-1, Bureau staff completed data tables and a combined report for Biota & Terrestrial 1 and 2 sampling events.

Bureau staff completed data tables and a combined report for Biota & Terrestrial 1 and 2 sampling events. All samples were submitted to an independent analytical laboratory for analysis of TAL total metals, gamma-emitting isotopes, perchlorate, and high explosive compounds. Data results were compared to the New Mexico Environment Department Technical Background Document for Development of Soil Screening Levels, Revision 5.0, August 2009; and the Background Concentrations of Constituents of Concern to the Sandia National Laboratories/New Mexico Environmental Restoration Project and the Kirtland Air Force Base Installation Restoration Program, Revised September 1997. The former document provides site managers with a framework for developing and applying the soil screening levels (for appropriate land uses) to determine if areas or entire sites are contaminated to an extent that warrants further investigation. The tables of the latter document provide “Approved Background Concentrations, Sandia National Laboratories/Kirtland Air Force Base.”

All results for TAL metals were below established screening levels but several constituents exceeded background levels at various onsite and off-site sampling locations. The arsenic background level of 5.6 mg/kg was exceeded at sampling sites C-A-68 and S-S-33 with concentrations of 7.4 mg/kg and 16.7 mg/kg respectively. The soil screening level for arsenic is 17.7 mg/kg. The beryllium background level of 0.65-0.80 mg/kg was exceeded at fourteen of the thirty-two sites, both onsite and off-site. Concentrations varied from 0.68 mg/kg to 1.77 mg/kg. The soil screening level is 2,260 mg/kg. The lead background level of 21.4 mg/kg was exceeded at sample cite C-S-11 (off-site) with a concentration of 46.3 mg/kg. The soil screening level is 800 mg/kg. The selenium background level of <1 mg/kg was exceeded at three sites (P-A-60, P-S-60, and S-A-85). Concentrations varied from 5.11 mg/kg to 5.52 mg/kg. The soil screening level is 5,680 mg/kg. The cobalt background level of 5.2 mg/kg was exceeded at ten sites (off-site, perimeter, and onsite). The concentrations were between 5.3 mg/kg and 8.2 mg/kg. The soil screening level has not been established. The barium background level of 130 mg/kg was exceeded at six sites, all onsite locations. The concentrations ranged from 135 mg/kg to 249 mg/kg. The soil screening level is 224,000 mg/kg. The nickel background level of 11.5 mg/kg was exceeded at four sample sites (one off-site and three onsite) with concentrations of 13 mg/kg to 21 mg/kg. The soil screening level is 22,700 mg/kg.

Uranium-235 exceeded the approved background concentration of 0.16 pCi/g with an activity of 0.27 pCi/g at sample site S-S-2SE (located at the Mixed Waste Landfill). All remaining gamma-emitting isotopes were below established background levels. No other analytes exceeded established criteria.

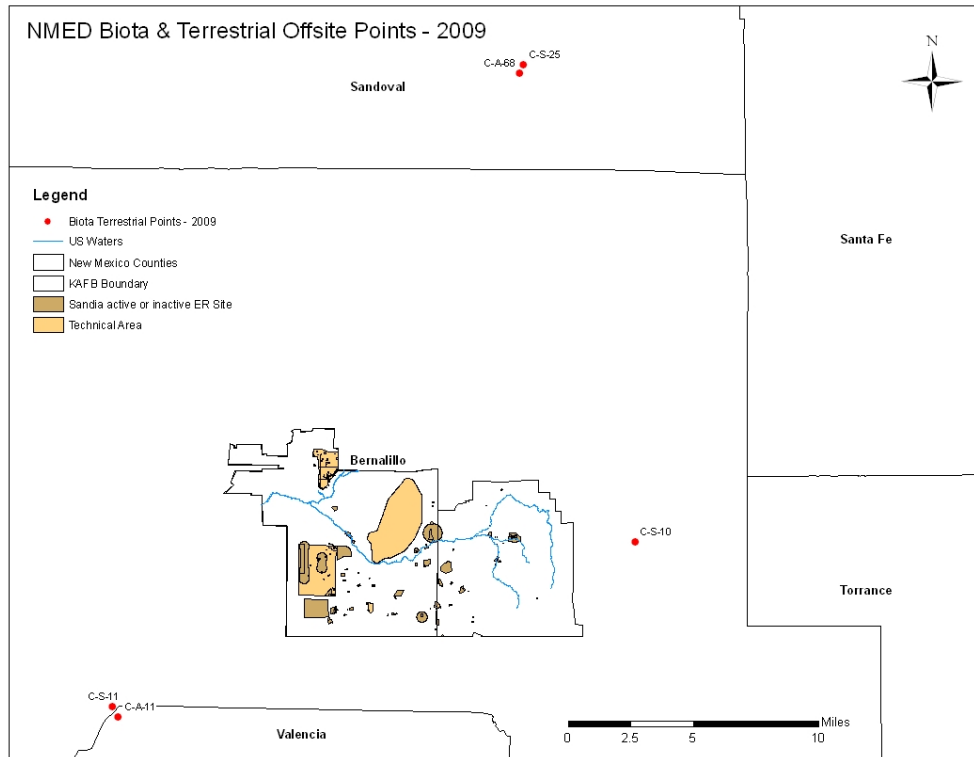


Figure STE49-1: NMED biota and terrestrial offsite sampling sites – 2009.

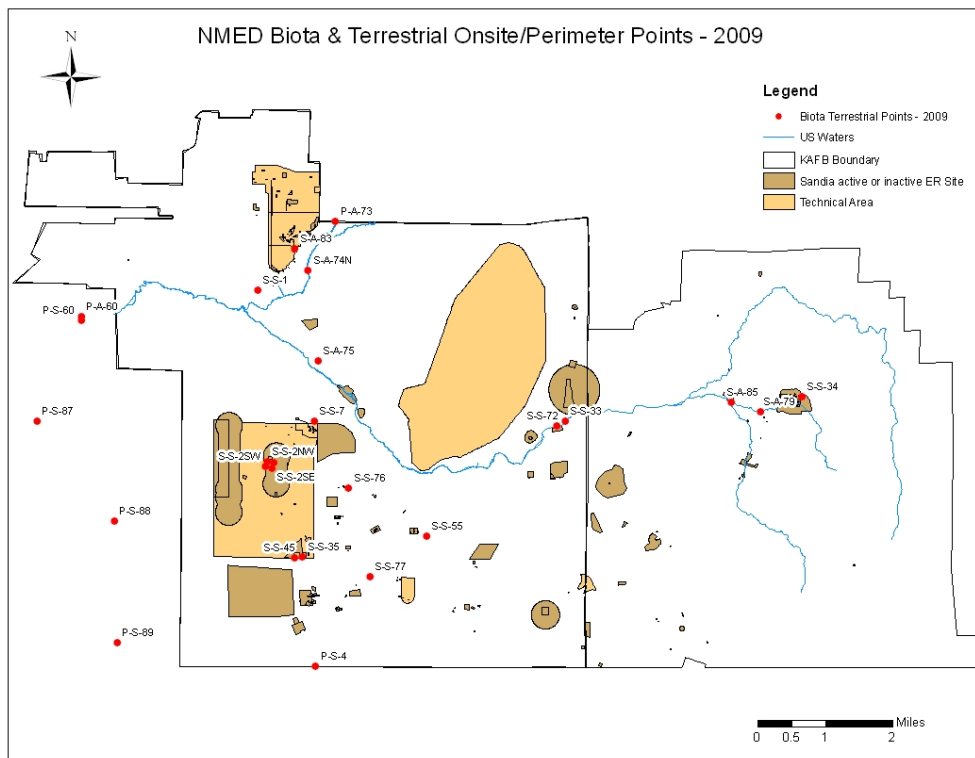


Figure STE49-2: NMED biota and terrestrial onsite/perimeter sampling sites – 2009.

WASTEWATER PROJECT (SWW51)

Under this Activity ID, Bureau staff conducts annual sampling of wastewater discharges from SNL operations in a cooperative effort with Sandia and the City of Albuquerque.

Quarterly Summary: During FFY10 Q-1, Bureau staff completed the semi-annual waste water sampling event.

Bureau staff completed the semi-annual waste water sampling event with Sandia and the City of Albuquerque staff. Samples were collected at four monitoring stations for TAL dissolved metals, gross alpha/beta, gamma spectroscopy, fluoride, tritium, and total cyanide. Analytical results are pending.

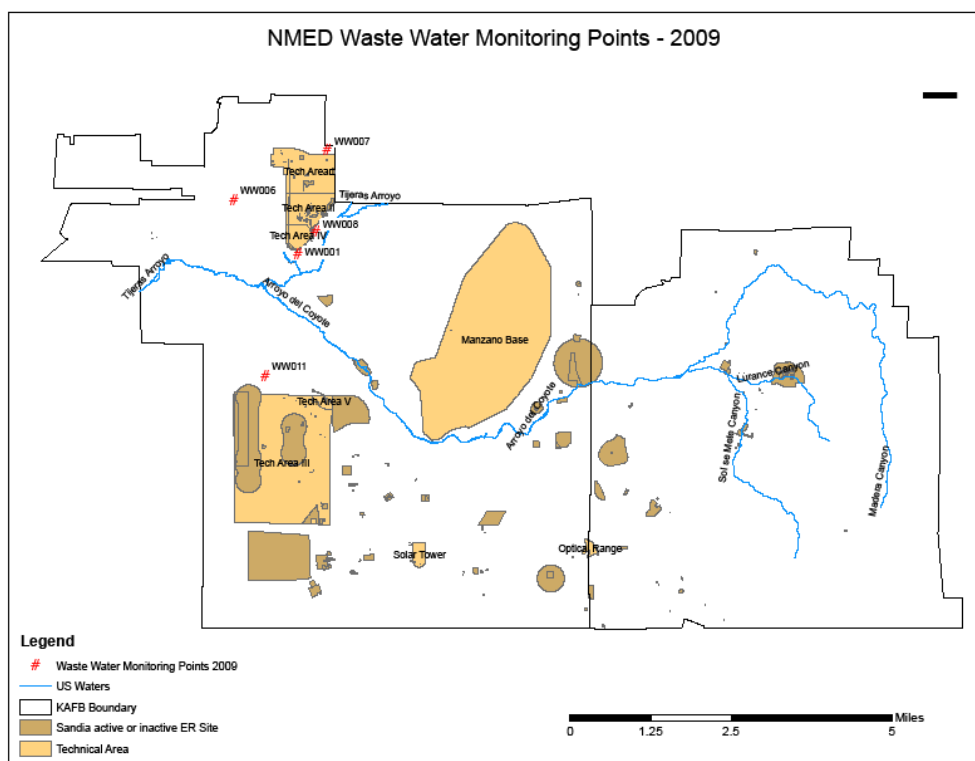


Figure SWW51-1: NMED wastewater sampling sites – 2009.

SOIL AND SEDIMENT PROJECT (SSS53)

Under this Activity ID, Bureau staff conducts annual soil sampling in a cooperative effort with Sandia to evaluate clean-up efforts by Sandia after open-air explosive experiments.

Quarterly Summary: During FFY10 Q-1, there was no activity.

TECHNICAL REVIEW (STR54)

Under this Activity ID, Bureau staff provides technical support to DOE and Sandia, other bureaus in NMED, state and federal entities, and public interest and oversight groups.

Quarterly Summary: During FFY10 Q-1, there was no activity to report.

NPDES MONITORING (SNP55)

Under this Activity ID, Bureau staff conducts site evaluations in consultation with Sandia to determine compliance with facility-generated Stormwater Pollution Prevention Plans, and to monitor activities after reportable spills on SNL.

Quarterly Summary: During FFY10 Q-1, there was no activity to report.

WASTE ISOLATION PILOT PLANT OVERSIGHT GENERAL ADMINISTRATION (WAD70)

Under this Activity ID, the Bureau manages, administers, and finances the overall activities of staff members in the Carlsbad office. Staff provides assistance to the Bureau and DOE developing workplans, budgets and training requirements.

Quarterly Summary: During FFY10 Q-1, Bureau staff completed required periodic training and provided oversight during the new, salt water pond construction.

Staff Scientist Thomas Kesterson completed the Hazardous Waste Worker Refresher (HWW-102). This class is for hazardous waste operations associated with the site-generated hazardous waste worker duties. Refresher training is required every year. Upon completion of this course, one should be able to perform hazardous waste worker duties in compliance with established policies, procedures, and regulations.

Bureau staff visited the site of the new salt water pond at WIPP this quarter to view construction progress. The new pond is located just north of the WIPP, west of the salt pile, and east of the North Access Rd. At the time of the visit, the first layer of 60 mil liner had been installed. This will be followed by the installation of a 200 mil layer of Geonet. Finally, a layer of 60 mil liner would be installed. When completed, this pond will have an evaporative surface area of four acres.



Left image: View from the south of construction work in progress on the new evaporation pond at the WIPP.

Right image: View from the bottom of work crews preparing to install another section of liner in the new evaporation pond at the WIPP.



Figure WAD70-3: View demonstrating how the liner is laid across the bottom of the new evaporation pond at the WIPP.

Bureau staff continues to monitor reports submitted by CBFO to the HWB documenting exceedances of carbon tetrachloride (CCl_4) in the repository air above the concentration of concern (165 parts per billion by volume, or ppbv), listed in Table IV.F.2.c of the WIPP Hazardous Waste Facility Permit. The normalized laboratory concentration of CCl_4 analyzed from a sample collected on November 11, 2009 was 209.9 ppbv. Notification is provided in accordance with Permit Condition IV.F.2.c (Notification Requirements). The DOE reported the running annual average for carbon tetrachloride as 104.5 ppbv.

PUBLIC OUTREACH (WPO71)

Under this Activity ID, Bureau staff interacts with the public through meetings, listening sessions, website development, consultations, and reports.

Quarterly Summary: During FFY10 Q-1, Bureau staff participated in the 108th WIPP Quarterly Meeting.

Staff members attended the 108th WIPP Quarterly meeting at the Skeen-Whitlock Building in Carlsbad on October 22, discussing WIPP activities of the previous quarter.

EXHAUST AIR MONITORING PROJECT (WEA72)

Under this Activity ID, Bureau staff monitors the air exiting the underground of the WIPP site. Staff collects air filters daily and attends weekly or bi-weekly preventative maintenance probe pulls.

Quarterly Summary: During FFY10 Q-1, Bureau staff continued to monitor the air quality emissions from underground operations on a daily basis and staff observed weekly or bi-weekly measurements of salt accumulation on shrouds.

Air quality emissions monitoring:

Bureau staff continued daily NESHAP air filter collection at WIPP Station A and Station B. Station A (the EPA compliance point) sits atop the fourteen-foot diameter exhaust air shaft where it turns 90-degrees toward the blowers which pull air through the mine at an average of 144,000 cubic feet per minute.

The monitor at Station A samples unfiltered air from the underground. Station A contains three skids, identified as A-1, A-2, and A-3. Two of these skids are in service at any one time, with one serving as the “Primary” and the other serving as “Back-up.” The third skid is usually secured or out-of-service for scheduled preventative maintenance or repairs.

Two Gast vacuum pumps, Model G561X are found at each skid. One pump operates continuously while the other remains in stand-by mode engaging automatically in a low-flow condition. These pumps pull air through three legs; one each assigned to Carlsbad Environmental Monitoring and Research Center (CEMRC), WIPP, and to the Bureau. Filters are collected from the Station A Primary skid and the Back-up skid each morning. Primary filters are compiled by month and shipped to the contract lab for analysis. Back-up filters are archived for future use, if required. Station B filters are routinely collected on Wednesday mornings.

During this quarter, Bureau staff received the results for Station A for January through June 2009 from the contract laboratory. The data report showed results for selected analytes indicating the results in $\text{nBq/m}^3 \pm 2\text{TPU}$ (Total Propagated Uncertainty). For cesium-137 (Cs-137), strontium-90 (Sr-90), uranium-235 (U-235) and uranium-238 (U-238), no results were recorded above the sample Minimum Detectable Concentration (MDC). In April, plutonium-238 (Pu-238) showed a result above the sample MDC but below the requested MDC. In January and May, U-234 showed results above the sample MDC but below the requested MDC. The results from the April samples for Am-241 and Pu-239/240 were above both the sample MDC and the requested MDC. The April Am-241 result of $1,736 \pm 836 \text{ nBq/m}^3$ was above the pre-operational baseline of $25 \pm 177 \text{ nBq/m}^3$ (18 samples) as determined in the Environmental Evaluation Group document (EEG-90) and correlates reasonably with the WIPP value of $1,803 \pm 679 \text{ nBq/m}^3$. The April Pu-239/240 result of $7,731 \pm 2,051 \text{ nBq/m}^3$ was above the pre-operational Baseline of $25 \pm 200 \text{ nBq/m}^3$ (20 samples) as determined in the Environmental Evaluation Group document (EEG-90) correlated reasonably with the WIPP value of $5,682 \pm 1,049 \text{ nBq/m}^3$. The results are tabulated below in Figure WEA72-1

Analyte	Month	Result (pCi/sample)	2TPU	MDA	Flag	Result (nBq/m ³)	2TPU
Am-241	Jan-09	0.010	0.021	0.031	U	146	307
	Feb-09	0.002	0.020	0.035	U	36	325
	Mar-09	0.002	0.022	0.038	U	35	320
	Apr-09	0.110	0.053	0.030		1736	836
	May-09	0.018	0.022	0.033	U	257	314
	Jun-09	0.000	0.020	0.015	U	0	311
Cs-137	Jan-09	0.063	2.800	4.600	U	9221	40981
	Feb-09	0.320	3.000	5.000	U, M	5192	48677
	Mar-09	-1.500	2.800	4.700	U	-21826	40742
	Apr-09	-3.200	3.100	5.500	U, M	-50491	48913
	May-09	-3.300	3.100	5.400	U, M	-47092	44238
	Jun-09	0.320	2.800	4.800	U	4978	43556

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Pu-238	Jan-09	0.0110	0.0210	0.0150	U	161	307
	Feb-09	-0.0035	0.0210	0.0360	U	-57	341
	Mar-09	0.0006	0.0200	0.0400	U	8	291
	Apr-09	0.0170	0.0210	0.0150	LT	268	331
	May-09	-0.0030	0.0200	0.0350	U	-49	285
	Jun-09	0.0040	0.0190	0.0280	U	59	296
Pu-239/240	Jan-09	0.027	0.026	0.030	U	395	381
	Feb-09	0.011	0.021	0.016	U	178	341
	Mar-09	0.011	0.021	0.016	U	160	306
	Apr-09	0.490	0.130	0.030		7731	2051
	May-09	0.010	0.020	0.029	U	136	285
	Jun-09	-0.001	0.019	0.042	U	-17	296
Analyte	Month	Result	2TPU	MDA	Flag	Result	2TPU
		(pCi/sample)		(nBq/m ³)			
Sr-90	Jan-09	0.031	0.31	0.70	U	454	4537
	Feb-09	-0.098	0.25	0.58	U	-1590	4056
	Mar-09	-0.280	0.26	0.62	U	-4074	3783
	Apr-09	0.077	0.25	0.56	U	1215	3945
	May-09	-0.110	0.27	0.64	U	-1570	3853
	Jun-09	0.085	0.27	0.59	U	1322	4200
U-234	Jan-09	0.091	0.059	0.069	LT	1332	864
	Feb-09	0.058	0.059	0.094	U	941	957
	Mar-09	0.059	0.050	0.067	U	858	728
	Apr-09	0.035	0.050	0.098	U	552	789
	May-09	0.066	0.049	0.050	LT	942	699
	Jun-09	0.034	0.042	0.072	U	529	653
U-235	Jan-09	0.006	0.031	0.046	U	89	454
	Feb-09	-0.010	0.042	0.083	U	-162	681
	Mar-09	-0.006	0.034	0.059	U	-81	495
	Apr-09	0.016	0.033	0.048	U	252	521
	May-09	-0.002	0.033	0.072	U	-26	471
	Jun-09	-0.003	0.034	0.050	U	-44	529
U-238	Jan-09	0.041	0.041	0.061	U	600	600
	Feb-09	0.024	0.036	0.063	U	389	584
	Mar-09	0.032	0.037	0.056	U	466	538
	Apr-09	0.003	0.035	0.090	U	49	552
	May-09	-0.002	0.033	0.072	U	442	585
	Jun-09	0.017	0.029	0.057	U	264	451

Figure WEA72-1: Summary of radionuclides captured at Station A, Jan-Jun 2009

Salt accumulation on shrouds monitoring:

Staff members observe probe pulls at Station A when they are removed for preventative maintenance and cleaning of shrouds and nozzles (the probe). Maintenance and cleaning is usually conducted weekly although this operation may be scheduled bi-weekly during the summer or holiday periods as conditions permit. Personnel from WTS, CEMRC, US DOE, and CTAC are present along with Bureau personnel. Regular maintenance of the nozzles and shrouds minimizes the accumulation of salt and ensures the collection of representative samples of particulates on the filter. During shroud removal, the condition of the probes are photographed for documentation and the images are forwarded to the EPA Region Six in Dallas, Texas.

The amount of salt occlusion on the probes is measured by WTS personnel and reported to the Bureau and the EPA. An occlusion of thirty percent or greater on the nozzle indicates that a representative air sample cannot be obtained from the effluent air stream. During this quarter, the nozzle from Skid A-1 exceeded thirty percent occlusion multiple times, however this skid did not serve as a skid of record at any time during the period.



Left image: Example of probe with little salt accumulation.



Right image: Example of probe showing abundant salt accumulation.

	Skid 1	Skid 2	Skid 3
10/13/09	4.91	10.59	
10/27/09	15.4	15.3	
11/3/09	14.9	10.1	
11/10/09	8.48	11.3	17.7
11/18/09	48.86	8.21	8.54
12/2/09	84.3	18.76	18.15
12/8/09	19.84	9.25	9.24
12/15/09	36.48	23.91	20.51
12/31/09	61.33	14.49	14.57

Figure WEA72-4: Occlusion rates (%) as measured at each probe pull.

DIRECT PENETRATING RADIATION PROJECT (WDP73)

Under this Activity ID, Bureau staff uses Electret passive ion chambers to evaluate the ambient gamma radiation at WIPP.

Quarterly Summary: During FFY10 Q-1, Bureau staff continued to monitor direct penetrating radiation from 14 stations at WIPP and at background locations.

The Electret passive ion chamber functions on the principle of ion pair production resulting from gamma photons interacting with air molecules within an air-vented ("S" type) chamber of predetermined volume to reduce the voltage of a charged Teflon™ disk. The voltage drop is proportional to the amount of gamma photons passing through the chamber. By using the change in voltage, a dose in units of milliRem (mrem) at a particular location can be determined with the use of a proprietary software algorithm.

Fourteen E-Perm® Electret Gamma Monitors have been placed along the fence line of the WIPP site with 3 monitors placed directly behind the waste handling bay. Additional Electrets are

placed offsite from WIPP. One is located in the town of Malaga along the southern transportation route and another is located at the terminus of the North Access Road and the Hobbs Highway (see Figures WPD73-1 and -2 below). Electrets serving as controls are deployed inside and outside of the Bureau office in Carlsbad. Readings are taken from the gamma monitors quarterly.

For the fourth quarter of calendar year 2009 direct penetrating radiation (DPR) results at the WIPP site ranged from a minimum average quarterly dose of 22.5 mrem at WIPP 3 (adjacent to the WIPP) to a maximum average quarterly dose of 32.8 mrem at WIPP 8 (on the north-east corner of the Exclusive Use Area fence). At WIPP 16 (at the rest area on US 285 between Loving and Carlsbad) the quarterly dose averaged 34.5 mrem. At this location TRU waste shipments enter the state via the southern route and undergo a Level VI vehicle inspection. At WIPP 17 (at the intersection of US 285 and the Black River Village Rd.) the quarterly dose averaged 29.2 mrem. This route has not been used since September 2008 and these measurements will provide good background information when transportation along this route resumes. At WIPP 15 (the most remote monitoring station from the WIPP site) the quarterly dose averaged 28.9 mrem. Quarterly values for all 18 monitoring stations are graphed at Figure WPD73-3 below.

The average annual total effective dose equivalent to the general population (non-smokers) from naturally occurring and manmade sources is about 360 mrem. These results indicate that activities at WIPP, or in the transportation of TRU waste to WIPP, contribute little or no measureable penetrating radiation to ambient background radiation.

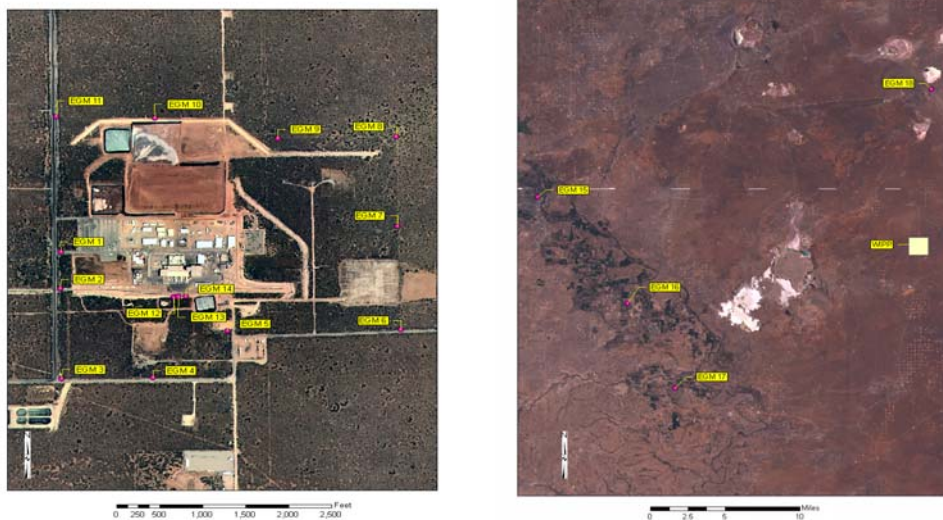


Figure WPD73-1: Electret Gamma Monitors (EGM) near the WIPP.

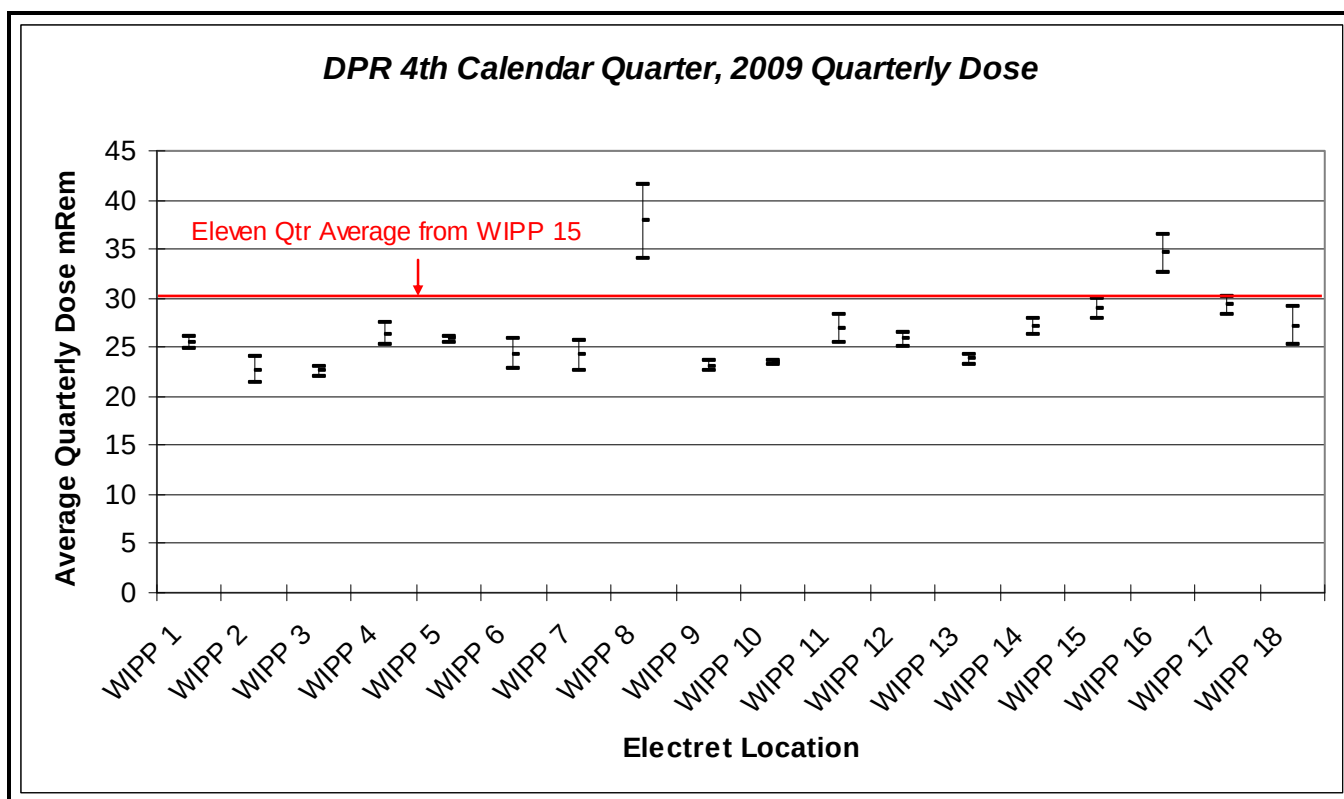


Figure WPD73-3: Direct Penetrating Radiation (DPR) CY09 Q-4 quarterly doses received at 18 WIPP monitoring stations.

PARTICULATES LOW-VOLUME AIR PROJECT (WPL74)

Under this Activity ID, Bureau staff evaluates the presence of selected radioactive particulates in the ambient air affected by WIPP.

Quarterly Summary: During FFY10 Q-1, Bureau staff continued to monitor ambient air quality for radioactive particulates from 5 stations at WIPP, in Carlsbad, and in Artesia.

Air particulate matter consists of minute “dust” particles in the air. These particulates are collected on glass fiber filters at seven air sampling locations every two weeks. Filters from each location are composited by quarter sent to a commercial laboratory for analysis of americium-241, cesium-137, strontium-90, and isotopes of plutonium and uranium. Five air samplers are located at WIPP, one is located at the Carlsbad office, and one is located in Artesia. Water vapor is collected by passing a known volume of air through a silica gel-filled cartridge. The gel is a hydrophilic compound that traps ambient air moisture from which atmospheric tritium may be extracted and measured.



Figure WPL74-1: Air Sampling Stations near WIPP.

Seven low-volume air samplers are currently deployed. Five samplers are located at, or near, the WIPP, one is located at the Carlsbad office, and one is located at Jaycee Park in Artesia. Each low-volume air sampling station uses a vacuum pump in series with a flow controller that restricts air throughput to 2.0 standard cubic feet per minute (SCFM) volume. Preventative maintenance on the pumps is performed on a schedule or as needed by staff and filters are collected every two weeks. Filters compiled by quarter and sent for analysis.

Analytical results from filters collected during the second quarter are reported below for: uranium-234, 235, 238, plutonium-238, 239/240, americium-241, cesium-137, and strontium-90. All results were reported as below the sample minimum detectable concentrations (MDCs) indicating no measureable contribution from WIPP activities to background levels established by the Environmental Evaluation Group (EEG-90)

GENERAL ER/EM PROJECTS (WGE75)

Under this Activity ID, Bureau staff conducts multi-media environmental sampling on a periodic basis, and provides technical review services to the DOE, WIPP and public interest groups.

Quarterly Summary: During FFY10 Q-1, Bureau staff drafted the report of area sediment sampling and coordinated VOC sampling with WRES staff.