University of New Mexico

2008 Storm Water Management Plan

University of New Mexico
Department of Safety & Risk Services
MSC07 4100
1 University of New Mexico
Albuquerque, NM 87131

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LIST OF COMMON ACRONYMS

AMAFCA	Albuquerque Metropolitan Arroyo Flood Control Authority
BMP	Best Management Practices
CABQ	City of Albuquerque
CAR	Corrective Action Request
CCTV	Closed Circuits Television
CID	Construction Industries Division
CNM	Central New Mexico University
DMR	Discharge Monitoring Report
DPM	Development Process Manual
DPM	Development Process Manual
EPA	Environmental Protection Agency
I I	Infiltration/Inflow
IPM	Integrated Pest Management
LEED	Leadership in Engineering and Environment Design
MCM	Minimum Control Measures
MRGWQSWG	Middle Rio Grande Water Quality Standards Work Group
MS4	Municipal Separate Storm Sewer System
MSDS	Material Safety Data Sheet
NDC	North Diversion Channel
NMDOT	New Mexico Department of Transportation
NMED	New Mexico Environment Department
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System

List of Common Acronyms (cont)

OCP	Office of Capital Planning
SDC	South Diversion Channel
SIC	Standard Industrial Code
SRS	Safety and Risk Services
SS	Silver Standard
SWMP	Storm Water Management Plan
SWMP	Storm Water Management Plan
TMDL	Total Maximum Daily Load
UNM	University of New Mexico
USEPA	United States Environmental Protection Agency
USGS	United States Geological Service

INTRODUCTION

Founded in 1889, The University of New Mexico (UNM) is a public university occupying approximately 600 acres (2.4 km²) along old Route 66 in the heart of Albuquerque, New Mexico. (Coordinates: 35°05'02"N 106°37'07"W / 35.08389°N 106.61861°W / 35.08389; -106.61861). The campus, for purposes of this program are divided into three main areas: Main or Central Campus, North Campus (including the Health Sciences Center), and South Campus.

The Main Campus, depicted in Figure 1, is generally bounded on the north by Lomas Boulevard NE., a city street; on the east by Girard Avenue NE., a city street; on the south by Central Avenue NE., a city street; and on the west by University Boulevard NE., a city street.

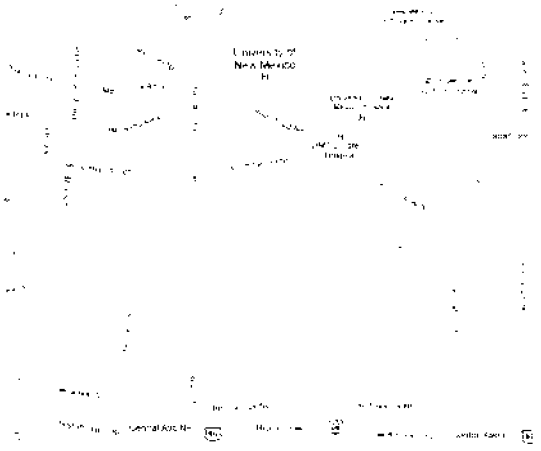

Figure 1.University of New Mexico Main Campus.

The North Campus, depicted in Figure 2, is bounded on the north by Indian School Road NE., a city street; on the east by Stanford Drive NE., a city street; on the south by Lomas Boulevard NE., a city street; and on the west by University Boulevard NE., a city street.

Figure 2.University of New Mexico North Campus.

Finally, the South Campus, depicted in Figure 3, is bounded on the north by the Albuquerque Public Schools and Albuquerque CNM, both educational institutional entities; on the east by Buena Vista Drive NE, a city street; on the south by private properties; and on the west by Interstate 25, a state highway.

Figure 3.University of New Mexico South Campus.

UNM does not discharge directly into the receiving waters, the Rio Grande River. Storm water runoff from the Main Campus discharges into the City of Albuquerque and AMAFCA storm drain systems. From this point, storm water runoff from the Main Campus eventually reaches the Rio Grande. Storm water runoff from the North Campus discharges into the City of Albuquerque storm drain system and/or the North Diversion Channel (NDC), operated and maintained by the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA). From these points, storm water runoff from the North Campus eventually reaches the Rio

Grande. Storm water runoff from the South Campus discharges into the City of Albuquerque storm drain system and/or the South Diversion Channel (SDC), operated and maintained by the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA). From these points, storm water runoff from the South Campus eventually reaches the Rio Grande. AMAFCA is also a co-applicant with the City of Albuquerque. UNM has recently began to develop land west of University Blvd. NE, north of Lomas Blvd. NE, west of Interstate 40 and south of Indian School Road NE (a.k.a. "Lands West"). The outfall for Lands West is the Odelia Pond, a storm water detention facility owned, operated and maintained by the City of Albuquerque.

STORM WATER MANAGEMENT PROGRAM

The Storm Water Management Plan (SWMP) that follows describes the actions the University of New Mexico will take to protect water quality and satisfy applicable requirements of the general permit. The intent is to develop, implement and enforce a SWMP that will reduce the discharge of pollutants to the maximum extent practicable, reducing quantity and increasing quality of storm water runoff. The SWMP contains the six Minimum Control Measures (MCM) required by the Environmental Protection Agency (EPA), listed below. The SWMP addresses each MCM with activities, Best Management Practices (BMPs) and its corresponding measure of attainment. Program development and full implementation of this SWMP is proposed over five years from the effective date of the permit. The SWMP has been prepared to comply with the EPA's Storm Water Phase I Final Rule (64 FR 68722) to improve storm water quality in accordance with the Clean Water Act of 1972.

STORM WATER MANAGEMENT PLAN: MINIMUM CONTROL MEASURES

1. Construction Site Storm Water Runoff Control
2. Post-Construction Strom Water Management in New Development and Redevelopment
3. Pollution Prevention Good Housekeeping the University of New Mexico
4. Industrial and High Risk Runoff
5. Illicit Discharge Detection/Elimination and Improper Disposal
6. Monitoring Programs –Wet and Dry Weather
7. Storm Event Discharge Monitoring
8. Spill Prevention and Response
9. Public Education and Outreach on Storm Water Impacts
10. Public Involvement/Participation
11. Bacterial TMDL, Toxicity, and Dissolved Oxygen Monitoring Programs

LEGAL AUTHORITY

UNM has the legal authority to control and prohibit discharges to its storm drainage system. The UNM storm drainage system outfalls to both the City's municipal separate storm sewer system (MS4) and AMAFCA's MS4. The legal authority of the City & AMAFCA is established through enabling legislation and the NPDES MS4 Permit.

REVIEWING AND UPDATING THE SWMP

Material changes to the SWMP, including changes to any BMP activities or identified measurable goal will be mentioned in annual reports. Any such SWMP updates will provided to the other co-permittee, in conjunction with the preparation for the Annual Report. The SWMP will be evaluated for implementation status of the components and the effectiveness when more effective approaches are discovered. Should this review prove need for revision, these modifications will be identified in the Annual Report. Specifically, for the University, these changes may also include: changes in roles and responsibilities of co-permittees, including interagency agreements developed for MS4 permitting purposes.

PARTIES SHARING RESPONSIBILITIES

The University of New Mexico (UNM) is a state entity under the laws of the State of New Mexico. The Main, North and South Campuses all lie within the Corporate Limits of the City of Albuquerque, New Mexico, a municipality as well as the jurisdiction of the Albuquerque Metro Arroyo Flood Control Authority (AMAFCA). The City, AMAFCA and UNM are co-permittees along with the New Mexico Department of Transportation (NMDOT). A copy of the Cooperative Agreement is included in Appendix A. As a co-permittee of the Albuquerque (the municipality) MS4 Storm Water Permit, the University of New Mexico is seeking authorization to discharge storm water under the National Pollutant Discharge Elimination System (NPDES) General Permit (NMS000101).

SECTION 1. CONSTRUCTION SITE STORM WATER RUNOFF CONTROL

Table 1.1
Construction Site Storm Water Runoff Control

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.2.a and b	• UNM addresses pollutants in storm water runoff from construction with design and technical requirements for the construction which involves maintenance and schedule activities for structural controls.	• UNM will review and revise design criteria are addressed in the Uniform Technical Guidelines as necessary. UNM will review and revise issues New Construction and Renovation as necessary.	UNM Office of Capital Planning (OCP)	May 1995
Part 2.5.2.c.(2)	• The UNM requires the preparation of a Storm Water Pollution Prevention Plan by construction contractors (SWMP) for each construction project that disturbs one-acre or more, or that are a part of a common development or plan of sale. The SWMP must address erosion and sediment control, both structural and non-structural approaches as applicable.	• UNM will update the Design Standards Specifications to better address SWMP requirements.	UNM Office of Capital Planning (OCP)	May 12, 2009
	• UNM is normally required, by Executive order, to build green to US Green Building Council's Leadership in Engineering and Environment Design (LEED) Silver Standard (SS) or better on sites with greater than one acre disturbance. LEED Silver requires SWMP at a minimum.	• UNM will strive to extend beyond that to earn LEED points with SS credits (reference sections of the permit which relate to controlling storm water quality and quantity) as it applies to sediment control.	UNM Office of Capital Planning (OCP)	January 2006

Table 1.1
Construction Site Storm Water Runoff Control

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.2.e.(2) (cont)	• The University provide to construction contractors the UNM Design Standards Specifications in the bid package for construction, safety, and environmental issues required for compliance, including: Fugitive Dust Control, adhering to the Erosion and Sediment Control plans, Solid Waste Control, Construction Wash-Off and other storm water pollution prevention issues	• UNM will update the Design Standards Specifications.	UNM Office of Capital Planning (OCP)	May 12, 2009
	• At the Construction Document Review (90%) of design, preconstruction, the University will inform the contractors of requirements to obtain and review documents necessary (i.e., erosion control plan, SWMP and fugitive dust permit).	• UNM will incorporate the updated Standard Specification requirements into review process and/or checklists	UNM Office of Capital Planning (OCP)	May 12, 2009
	• Prior to 70% stabilization, the University will obtain the NPDES permit for the specified project.	• UNM will establish a schedule to update the NOI list on a regular basis.	Safety and Risk Services (SRS) Physical Plant: Engineering (PPD)	November 1, 2012

Table 1.1
Construction Site Storm Water Runoff Control

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.2.e.(2) (cont)	• During construction UNM requires contractor to limit the amount of runoff and damage to storm water system. UNM will expect at the minimum standards and activities to be performed to ensure this goal. Some of the requirements include: a. Soil is maintained within the project limits. b. Soil erosion and sedimentation control plans must be done by a licensed engineer. c. Contractor will not pump water from trenches and other excavations into catch basins, or manholes, without first proper treatment (e.g., approved sediment basin) d. The contractor will report any infractions, discharges, or problems to UNM during the construction.	• Contractor activities are measured by the requirements imposed with the contract and the degree with which these are accomplished in accordance with the Design Standards Specifications	UNM Office of Capital Planning (OCP)	May 12, 2009

Table 1.1
Construction Site Storm Water Runoff Control

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.2.e.(2) (cont)	e. Contractors will conduct all excavation, embankment, grading and clean-up operations such that discharge of siltaceous materials and waterborne material into any storm sewer, drainage ditch, river, lake, or underground utility system is limited f. All violations will be corrected within 12 hours of notification by the project representative to eliminate re-occurrences. g. Soil erosion and sedimentation extending beyond the project will not be permitted (i.e., tire track out, soil washing across turf and paved areas or into the underground utility systems). h. Overage or spillage of concrete will be picked up and disposed of properly.	• UNM will review and revise the Construction Specifications Standard to include or improve procedures to a. develop a metric to measure the degree of compliance with the Design Standards Specifications. b. verify and ensure that materials are not discharged to water systems. c. include metrics for soil maintenance. d. include requirements or incentives for better soil maintenance e. verify licensure of engineers. f. address sediment and erosion control as needed.	UNM Office of Capital Planning (OCP)	November 1, 2012
	i. During or following precipitation, UNM will conduct random checks for track out or any noticeable failures of BMPs on site perimeter.	• UNM will work with co-permittees to verify sampling procedures to ensure and quantify discharge.	Safety and Risk Services (SRS)	May 27, 2005
		• UNM will revise and review the Safety and Risk Services (SRS) manual to address sediment and erosion control		November 1, 2012
Part 2.5.2.e.(2) (cont)	• As part of the SWMP, UNM and the responsible contractor file NOI's separately. a. As operator, the contractor, files for the period from prior to construction through final payment or 70% stabilization (which ever occurs first) b. As owner, UNM assumes control prior to 70% stabilization.	• Monthly project meetings will be held to discuss the progress of the project and to work out any issues related to the construction of the facility	UNM Office of Capital Planning (OCP)	May 12, 2009

Table 1.1
Construction Site Storm Water Runoff Control

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.2.e.(3) and (4)	• After commencement of the project, the OCP project inspector will have authority for everyday oversight (if needed) of the project. Inspectors from PPD as well as the State Construction Industries Division (CID) will periodically visit the site to assess compliance with the plans and specifications.	• Contractors will develop and/or revise checklists for period inspections, especially after a storm, specifically addressing sediment and erosion control and NPDES compliance.	UNM Office of Capital Planning (OCP)	May 12, 2009
Part 2.5.2.e.(5)	• Based on periodic inspections data, a log will be compiled of the issues, complaints, corrective action requests throughout the construction period.	• Contractor will develop and maintain a Corrective Action Request (CAR) system for each project • Contractor will track the CAR's progress and completion • Logs will be reviewed regularly to update and measure progress.	UNM Office of Capital Planning (OCP)	November 1, 2012
Part 2.5.2.e.(6)	• UNM has the contractual ability to assess contractors for damages resulting from improper and/or negligent acts. • UNM may collect up to $1000 per day per violation from contractors found in non-compliance with the NPDES or SWMP. • UNM may take enforcement actions on violations of the Construction Site Specifications regarding discharges.	• UNM will update construction specification documents to include updated enforcement policies and penalties as necessary.	UNM Purchasing Department	May 12, 2009
		• UNM will develop a schedule and inform the City of Albuquerque of any uncorrected infractions not corrected in a timely manner.	UNM Office of Capital Planning (OCP)	November 1, 2012

Table 1.1
Construction Site Storm Water Runoff Control

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.2.e.(7)	• UNM recognizes the value of input and complaints of off-site sedimentation problems on the part of its citizens, staff, students, and faculty. As part of UNM's commitment to stewardship, UNM will investigate and may take actions on complaints from citizens regarding off-site sedimentation problems • In a proactive measure UNM has instituted some educational aids to encourage stewardship among non-project personnel.	• To educate and train its staff in the area of erosion and sediment control during construction, UNM has video, workbooks, and instructor manuals available entitled "Keeping Soil on Construction Sites" (Ohio Federation of Soil and Water Conservation Districts).	UNM Office of Capital Planning (OCP)	2001
		• UNM has NPDES Training the area of storm water quality BMPs. Example certificates are presented in Appendix B along with a summary of UNM's Operator Education & Training Program.		January 24, 2004
		• UNM hosts training on Environmental Health & Safety issues in construction, including storm water	Safety and Risk Services (SRS)	As needed
Part 2.5.2.f	• UNM will evaluate the feasibility of retaining runoff during construction on a project by project basis.	• UNM will update construction specification documents for the pre-construction and design phase to evaluate viability and impediments of 100% retention.	UNM Office of Capital Planning (OCP)	Nov 1, 2012

Permit Citation	Table 1.2 Plan/Additional Information
Part 2.5.2.c	Included in Appendix B is a copy of the certification of Operator Education and Training Program (Construction Runoff Program).
Part 2.5.2.d	UNM will document any changes to the Operator Education and Training Program for Storm Water Pollution Prevention at UNM summary in the required annual report. Currently there are none to report as of 2009.
Part 2.5.2.e.(1)	Included in Appendix C is a copy of the Design Standards Specifications given each construction contractor which serves as a manual delineating the technical criteria and specific sediment and erosion BMPs required from each construction site. This includes the latest revision of the EPA's General Permit for Storm Water Discharges from Construction Activities.
Part 2.5.2.e.(1)	Included in Appendix C is a copy of the New Mexico Environmental Regulations for Design Professionals.

SECTION 2. POST-CONSTRUCTION STORM WATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT

Table 2.1
Post-Construction Storm Water Management in New Development and Redevelopment

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.3.a and b	• UNM recognizes that pollutants in storm water runoff from construction are of serious consideration. UNM reduces these with design and technical requirements for the construction. These involve the use of structural and non-structural methods that will maintain and restrict run-off.	• UNM will review and revise design criteria are addressed in the Uniform Technical Guidelines as necessary.	UNM Office of Capital Planning (OCP)	November 1, 2012
		• UNM will review and revise issues New Construction and Renovation as necessary		November 1, 2012
		• UNM will review and revise design criteria Design Standards Specifications as necessary		May 12, 2009
Part 2.5.3.e	• UNM has a Master Drainage Plan that collectively addresses both the Main and North Campuses.	• UNM will work to update the Master Drainage Plans as necessary, to include storm water aspects. • Future construction may address post-construction Storm water retention or treatment. • UNM will review and revise the Master Drainage plan for newly acquired land • The South Campus will not be developed until the South Campus Mater Drainage Plan is updated	UNM Department of Planning and Campus Development And Physical Plant Engineering (PPD)	1997
	• The Master Drainage Plan for the South Campus (dedicated to athletic and recreational activities or undeveloped and relatively low landscaping density)			1984
	• UNM has recently acquired is developing Lands West of University Blvd. NE, north of Lomas Blvd. NE, east of Interstate 40 and south of Indian School Road NE. A Master Drainage Plan is currently in progress			2008 * estimate

Table 2.1
Post-Construction Storm Water Management in New Development and Redevelopment

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.3.c.(1)	Post Construction on design criteria for UNM is addressed in several technical guidelines • UNM provides to construction contractors the UNM Design Standards Specifications (including post-construction BMPs) in the bid package for construction, safety, and environmental issues required for compliance, including, Fugitive Dust Control, adhering to the Erosion and Sediment Control plans, Solid Waste Control, Construction Wash-Off and other storm water pollution prevention issues • The Uniform Technical Guidelines - New Construction and Renovation (May, 1995). This document specifically set forth standards for design professionals and contractors while the specifications set forth standards for contractors • The Design Standards Specifications Details for Landscape Construction (March 1997). This document specifically set forth standards for design professionals and contractors while the specifications set forth standards for contractors	• National Pollutant Discharge Elimination System Manual, Storm Water Management Guidelines for Construction and Industrial Activities" has been adopted by: a. Office of Capital Projects and the Planning & Campus Development Dept., b. Physical Plant Department (PPD), c. Safety & Risk Services (SRS)	UNM Office of Capital Planning (OCP)	November 2002
		• UNM will operate and maintain post-construction and Landscaping storm water controls over facility lifetime. • UNM will modify and upgrade post-construction and Landscaping storm water controls as necessary.	Physical Plant: Grounds and Landscaping (PPD)	May 12, 2009

Table 2.1
Post-Construction Storm Water Management in New Development and Redevelopment

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.3.c.(1) (cont)	• Project manual specifications used for all campus construction projects • The "National Pollutant Discharge Elimination System Manual, Storm Water Management Guidelines for Construction and Industrial Activities", November 2002 • Informally, UNM has adopted Chapter 22 of the City of Albuquerque Development Process Manual (DPM) which deals with hydrology, drainage, and erosion control.			
	• All construction plans on UNM are reviewed by the OCP, with special interest directed toward impact on environmentally sensitive areas (e.g., critical water sheds, endangered species issues, riparian areas, historical properties, and existing infrastructure including storm drainage). • Plans do not proceed from planning to construction documents, or from construction documents to construction, until these issues have been addressed to the satisfaction of the OCP.	• UNM will review all environmental issues, including storm water, during the planning and design stages of projects.	UNM Office of Capital Planning (OCP)	May 12, 2009

Table 2.1
Post-Construction Storm Water Management in New Development and Redevelopment

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.3.e.(1) (cont)	UNM policy requires that project incorporate design features to Operation and Maintenance post-construction BMPs on areas greater than or equal to one acre and those less than one acre, but part of a larger development	• UNM may use non-structural storm water control measures integrated into renovation and redevelopment projects such as detention, erosion control through re-vegetation, water harvesting, and maintenance programs • UNM will educate developers, designers and, perhaps, the general public regarding the alternative design options and long-term maintenance requirements as part of the Public Education program. Contractors, developers and architects will be given information during the pre-construction and meetings in the Design Standards Specifications for the bid package • UNM will endeavor to minimize traffic on the Campuses through offsite parking • The University requires operators to maintain BMPs at the site until Notice of Termination (NOT) normally occurring as soon as the 70% of surface stabilization.	UNM Office of Capital Planning (OCP)	May 12, 2009
Part 2.5.3.e.(1) (cont)		• UNM will use street sweeping and buffer strip preservation non-structural controls on each project. • UNM will strive to schedule road repairs for the non-rainy season, whenever practicable	Physical Plant: Grounds and Landscaping (PPD)	2009

Table 2.1
Post-Construction Storm Water Management in New Development and Redevelopment

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.3.e.(2)	Those projects having a direct impact on existing City, AMAFCA, or NMDOT facilities will undergo an additional review by the potentially affected agencies to ensure that capacity exists and that appropriate measures are incorporated into the final design to prevent significant storm water pollutants from being transferred to the adjacent co-permittee.	• UNM will ensure that during the planning and design phase of the project that potentially impacts the co-permittees will have input. • The contractor will be required to adhere to any additional requirements, enforcements, or regulations imposed by the affected co-permittee via contract obligation (e.g., the City of Albuquerque can issue citations and levy fines against contractors found in violation)	UNM Office of Capital Planning (OCP)	May 12, 2009

Table 2.1
Post-Construction Storm Water Management in New Development and Redevelopment

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.3.e.(2) (cont)	The UNM OCP reviews plans at the 30, 60 and 90 percent levels. During each stage, special attention is paid to storm water management and control, and potential impacts to existing UNM and City facilities adjacent to or downstream from a proposed project	• During the 10% completion stage (conceptual design), UNM will perform a preliminary review of the documents to begin to identify real or potential issues with the building or site including environmental impacts on infrastructure or surrounding areas • During the 30% completion stage (schematic design) the plans are distributed for comment and discussion. Environmental impacts on the surrounding areas are better defined and what measures to be taken to mitigate these. • During the 60% completion stage (design development) the plans are re-distributed for review and comment. All major environmental issues have been identified. Grading plans will be near completion. Erosion and Sediment Control plans will be started. • During 90% completion stage. The documents are nearly. The Grading and Drainage Plan and the Erosion and Sediment Control Plan are complete. Any impact issues are mitigated.	UNM Office of Capital Planning (OCP)	May 12, 2009

Table 2.1
Post-Construction Storm Water Management in New Development and Redevelopment

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.3.c.(2) (cont)	• UNM will meet as necessary to discuss an approach to management of storm water quantity and quality	• To educate and train its staff in the area of erosion and sediment control during construction, UNM uses the video, workbooks, and instructor manuals entitled "Keeping Soil on Construction Sites" (Ohio Federation of Soil and Water Conservation Districts). • University staff will investigate training opportunities for storm water management issues.	Safety and Risk Services (SRS)	2009
Part 2.5.3.g	• UNM is normally required, by Executive order, to build green to US Green Building Council's Leadership in Engineering and Environment Design (LEED) Silver Standard (SS) or better on sites with greater than one acre disturbance. LEED Silver requires SWMP at a minimum.	• UNM will strive to extend beyond that to earn LEED points with SS credits (reference sections of the permit which relate to controlling storm water quality and quantity).	UNM Office of Capital Planning (OCP)	January 2006
		• UNM will revise and review the Standard Design Specifications to include Green Infrastructure components		May 16, 2009

Table 2.2 Post-Construction Storm Water Management in New Development and Redevelopment	
Permit Citation	**Plan/Additional Information**
Part 2.5.3.c	Included in Appendix D is a copy of the certification of the review of the Post Construction Storm Water Management in New Development and Redevelopment Program at UNM signed.
Part 2.5.3.d	UNM will document any changes to the Post-Construction Storm Water Management in New Development and Redevelopment Program at UNM summary in the required annual report.
Part 2.5.3.e.(3)	UNM will document and include copies of any changes or revisions made during the permit period in the required annual report
Part 2.5.3.g	Included in Appendix E is copy of the Executive order 2006-001 "State of New Mexico Energy Efficient Green Building Standards for State Buildings", January 16, 2006.

SECTION 3. POLLUTION PREVENTION AND GOOD HOUSEKEEPING PRACTICES

Table 3.1
Pollution Prevention and Good Housekeeping Practices

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.4.d	• UNM will strive to update its Pollution Prevention and Good Housekeeping Practices	• UNM will provide information of any revision or updates made within the year to any aspect of the Pollution Prevention and Good House Keeping Program, including SWMP documentation, during the permit year for inclusion in the Annual Report	UNM Office of Capital Planning (OCP)	2009
Part 2.5.4.f.(2)	• UNM recognizes the value pollution prevention and good housekeeping practices on the part of applicable employees. UNM covers this topic in periodic employee training	• To educate and train its staff in the area of erosion and sediment control during construction, UNM uses the video, workbooks, and instructor manuals entitled "Keeping Soil on Construction Sites" (Ohio Federation of Soil and Water Conservation Districts)	Safety and Risk Services (SRS)	2006+ estimate
		• UNM has NPDES Training the area of storm water quality BMPs. Example certificates are presented in Appendix B along with a summary of UNM's Operator Education & Training Program.		January 29, 2004

Table 3.1
Pollution Prevention and Good Housekeeping Practices

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
		• UNM will construct general pollution prevention and good housekeeping practices in web-based training for all new employees. This may remain part of "Basic Annual Safety Training", registered on the Learning Central which maintains training records for UNM personnel. Annual refresher training is required for all staff		2009
Part 2.5.4.g.(1) and (2)	• UNM will endeavor to reduce the amount of floatables in discharge and runoff. UNM periodically monitors a Floatables at one campus site to assess the adequacy of maintenance activities. The location for monitoring floatables is currently monitored the North West Observatory Parking Lot water quality inlets.	• UNM maintains a routine maintenance schedule to the areas of the campus that have potential to affect storm water pollution	Physical Plant: Grounds and Landscaping (PPD)	March 2009
		• UNM will direct developed storm water runoff to landscaped areas; flow from paved surfaces to infiltrate into the underlying soils. • UNM will continue to install and implement additional BMPs and retrofit structures as the campus grows.	UNM Office of Capital Planning (OCP)	May 16, 2009
Part 2.5.4.h.(1)	• UNM will continue to update Storm Water Quality facilities lists.	• UNM will update lists are structures are added or removed.	Safety and Risk Services (SRS)	Annually or more often as necessary
Part 2.5.4.h.(2)	• UNM will continue to review and monitor its Inspection and Maintenance program to ensure that the target number of structures per basin are inspected and maintained per quarter.	• UNM will perform annual review of structures and maintenance lists	Physical Plant (PPD)	2009
Part 2.5.4.i.(1)	• UNM uses deicing salts for snow management. Regular salt, Sodium Chloride, is used on the streets while calcium chloride is used on walkways.	• UNM will minimize application of salts. • UNM will add a higher percentage of benign components.	Physical Plant (PPD)	2009

Table 3.1
Pollution Prevention and Good Housekeeping Practices

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.4.i.(6)	• UNM strives to control litter at its source, the most effective is by picking up trash, and debris daily. This sets a good example for faculty, staff, students and visitors with high visibility and has proven an effective component in UNM's public awareness campaign.	• UNM will perform daily litter pick up during weekdays during the regular semesters • UNM will perform regular street-sweeping.	Physical Plant (PPD)	2009
Part 2.5.4.j.(3)	• UNM has an established program, the Integrated Pest Management (IPM), for the use of pesticides, herbicides and fertilizer on the Main, North and South Campuses.	• UNM will perform periodic update of the inventory of products accepted under the program, and collection of the Material Safety Data Sheets (MSDSs) for these products; • Identification of and adherence to transportation, storage, and disposal requirement • A shelf-life program to dispose of expired products; • Applicator training or certification • Safety training	Physical Plant: Environmental Services (PPD)	November 24, 2004
Part 2.5.4.k.(1)	• The changing of oil and the use of toxics are prohibited by the public on the UNM. • Public awareness exists regarding these restrictions and potential damages as discussed in section **2.5.9.a** and **b (Table 9.1)** of this document.	• The Campus Police provide enforcement with respect to these matters.	UNM Police Department	May 16, 2005
		• Procedures are established for handling potentially toxic substances and materials are discussed in Table 9.1.	Safety and Risk Services (SRS)	September 16, 2008

Table 3.1 Pollution Prevention and Good Housekeeping Practices				
Permit Citation	**BMPs**	**Measurable Goal (s)**	**Responsibility**	**Target Date for Achievement/ Implementation**
	• UNM has an automotive repair facility on the North Campus. • UNM has no student or public automotive repair facilities on the Main or South Campus.	• The depth of the used oil in the tank is periodically measured. • Records are kept at PPD. • The tank is emptied (pumped) by a local commercial oil company approximately every six (6) months for recycling. • Used antifreeze is stored in 55 gallon drums inside the repair shop (not exposed to the outside precipitation) • The used antifreeze is recycled by a local commercial oil company	Physical Plant: Environmental Services (PPD)	September 16, 2008
Part 2.5.4.k.(1) (cont)	• UNM also participates in the Public Awareness Campaign	• UNM includes handout materials with each campus parking permit	UNM Parking Services	2009
2.5.4.k.(3)	• UNM conducts its Fall Frenzy. Students are invited to participate in a campus-wide cleanup effort including most recently landscaping projects. This forum provides a fun activity that teaches students the value of controlling and reducing litter.	• UNM will conduct this project every Fall.	UNM Student Affairs	September 26, 2008

Table 3.2 Construction Site Storm Water Runoff Control	
Permit Citation	**Plan/Additional Information**
Part 2.5.4.j.(3)	Included in Appendix F is a copy of the memorandum and attached city regulations for pesticide, herbicide control UNM signed April 8, 1996.
Part 2.5.4.j.(3)	Appendix I Integrated Pest Management (IPM).
Part 2.5.4.k.(1)	Included in Appendix G is a copy of the Hazardous Chemical Waste Program which addresses the collection of used motor vehicle fluids and toxics
Part 2.5.4.k.(1)	Appendix G includes handout materials with each campus parking permit

SECTION 4. INDUSTRIAL AND HIGH RISK RUNOFF

Table 4.1
Industrial and High Risk Runoff

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.5.f.(3)	• Based on Standard Industrial Code (SIC), UNM operations are exempt from classification as an industrial high risk operation. All potentially "high risk" operations are conducted such as not to be exposed to precipitation. • UNM will review this classification and, if necessary, work to identify sites and develop program industrial runoff control program for High Risk runoff	• UNM strives to locate anything similar to "high risk" activity under cover or with secondary containment.	Safety and Risk Services (SRS)	May 16, 2005
		• UNM will integrate such information existing laboratory and building inspection program programs for sites similar to this category		November 1, 2012

Table 4.2 Industrial and High Risk Runoff	
Permit Citation	**Plan/Additional Information**
	No additional Information.

SECTION 5. ILLICIT DISCHARGE DETECTION/ELIMINATION AND IMPROPER DISPOSAL

Table 5.1
Illicit Discharge Detection/Elimination and Improper Disposal

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.6.a, b, f.(1) and f.(2).	• UNM has established inspection procedures and legal authority to prohibit of illicit discharges.	• The UNM PPD is responsible for inspecting the storm drainage systems on all Campuses. A Maintenance Activity Schedule (included in Appendix II) is followed.	Physical Plant (PPD)	March 2009
		• Inspections include storm inlets, area drains and storm drain piping. • SRS has established a 24-hour Duty Officer to respond to illicit discharge situations. If an illicit discharge is discovered during routine inspection, PPD, or by Campus Police, then SRS shall be contacted immediately to assist.	Safety and Risk Services (SRS)	March 2009
		• UNM will update the list of permitted dischargers on campus.		September 2009
Part 2.5.6.f (3)	• UNM has and continues to participate in the Storm Water Team a consortium of regional water authorities within the Rio Grande basin who are dedicated to the education of individuals and businesses on how to reduce storm water pollution by keeping trash and other pollution out of the storm water system.	• Production of a media released film to educate the public to encourage the awareness and reporting of illicit discharges	Safety and Risk Services (SRS)	2009

Table 5.2 Illicit Discharge Detection/Elimination and Improper Disposal	
Permit Citation	**Plan/Additional Information**
Part 2.5.6.c	Included in Appendix I is a copy of the certification of the review of the Illicit Discharge Detection and Elimination Program at UNM.
Part 2.5.6.a, b, f.(1) and f.(2)	Included in Appendix H is a copy of the storm water Maintenance Activity Schedule.
Part 2.5.6.a, b, f.(1) and f.(2)	Included in Appendix H is a copy of the last inspection
Part 2.5.6.f.(2)	Included in Appendix J is a copy of the updated list of dischargers to the MS4 that have filed for a NOI under the NPDES program

SECTION 6. MONITORING PROGRAMS – WET AND DRY WEATHER

Table 6.1
Monitoring Programs – Wet and Dry Weather

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.7.a.(1)	• Because of the arid conditions and sporadic rainfall generally do last more than a few hours, the co-permittees of the Albuquerque MS4 have combined the wet and dry weather screening (required by EPA MS4 Permit) into a year-round system screening process	• UNM continues to financially contribute to the co-permittee funding of United States Geological Service (USGS) monitoring and screening efforts. • Priorities for Dry Weather Screening are established to determine: 1. Cross-connections with sanitary sewers 2. Identify possible sources of illicit discharges into the MS4 system, and 3. Identify major sources of fecal coliform and floatable material entering the storm drainage system	Safety and Risk Services (SRS)	December 20, 2002
Part 2.5.7.a.(2) and (3)	• Dry weather screening is an integral part of screening	• Sampling will be performed of 50% of all major outfalls including sampling and analysis when flow is present to determine source. • Sampling will be conducted in the case of a complaint of suspect flow		

Table 6.1
Monitoring Programs – Wet and Dry Weather

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.7b.(1)	• UNM through a Cooperative Agreement with the City, AMAFCA, and the NMDOT (NMSHTD), participates in a Storm water Monitoring and Testing program. There is no dedicated UNM monitoring station due to the complex nature of the in fall and out fall from the campus. Rather, each area of the Campus is situated upstream of City and AMAFCA monitoring stations, ensuring that the UNM's runoff will be closely screened and analyzed.	• Priorities for Wet Weather Screening are established to determine: 1. Identify possible sources of illicit discharges into the MS4 system, and 2. Identify major sources of fecal coliform and floatable material entering the storm drainage system	Safety and Risk Services (SRS)	December 20, 2002
Part 2.5.7b.(1) (cont)	• Wet screening sampling emphasizes field observations and field testing.	• Each sampling point with be sampled and field tested following "Field Screening Sample Log" (Appendix K) • Screening will be conducted for: a. observed flow rate, b. turbidity, c. pH, d total conductance, e. dissolved oxygen, and f. visible gross pollutants • Suspicious flows a. will be traced to their origin b. additional tests may be conducted (if needed) to confirm the source and/or the suspected pollutants		

Table 6.1
Monitoring Programs – Wet and Dry Weather

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.7.b.(1) (cont), 2.5.7.b.(2), 2.5.7.b.(3)	• UNM in concert with the other co-permittees will continue to collect wet weather samples to monitor water quality	• The current sampling agreement with the co-permittees obligates UNM to contribute 13% of the funding for this. • There, at present there are 17 major outfalls discharging directly into the Rio Grande (Appendix E) • Wet Season monitoring points will be wet screened at least once a year and sampled at least once every other year. • UNM and its co- permittees will develop and revise sampling and non-sampling methods as necessary • UNM and co permittees develop a sampling regiment for all areas of the municipal Separate Storm Sewer System to be sampled at least once per year	Safety and Risk Services (SRS)	December 20, 2002

Table 6.2 Monitoring Programs – Wet and Dry Weather	
Permit Citation	**Plan/Additional Information**
Part 2.5.6.c	Included in Appendix I is a copy of the certification of the review of the Illicit Discharge Detection and Elimination Program at UNM
Part 2.5.6.f.(2)	Included in Appendix J is a copy of the updated list of dischargers to the MS4 that have filed for a NOI under the NPDES program.
Part 2.5.7.a.(1) and 2.5.7.b.(1)	Included in Appendix M is the cooperative agreement and sampling parameters and procedures for the Albuquerque MS4
Part 2.5.7.b.(1)	Included in Appendix K is a copy of the "Field Screening Sample Log"
Part 2.5.7.b.(1)	Included in Appendix N is a matrix of major sampling locations.
Part 2.5.7.b.(1)	Included in Appendix O is a matrix of monitoring Outfall Descriptions

SECTION 7. STORM EVENT DISCHARGE MONITORING

Table 7.1
Storm Event Discharge Monitoring

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.7.c.(1)	• Storm Even Discharge Monitoring shall be conducted on specified outfalls, internal sampling stations, and or in-stream monitoring locations to characterize the quality of storm water discharges from the Municipal Separate Storm Sewer System.	• Co-permittees will develop a sampling plan accorded by the EPA (Appendix P) • Co permittees will collect all necessary data to estimate for each major outfall (or sub-watershed) of seasonal pollutant loadings and event mean concentrations for a representative storm event in line with requirements of Tables 5.1.1 a (1) (Appendix P) • Co-permittees will provide the estimates for Annual Requirements • If necessary the data may be extrapolated from representative monitoring locations. • The estimates will take into account land uses and drainage areas.	Safety and Risk Services (SRS)	December 20, 2002
Part 2.5.7.c.(2)	• UNM will assist in investigation and identification of sources of pollution on campus.	• If SRS is notified about or self discovers indications of discharges, then on-site investigative work should begin within two (2) hours This time may be affected should the incident be discovered out of normal business hours, Monday through Friday and on holidays.		
Part 2.5.7.c.(2)	• As part of the Field Screening Program, UNM staff will continue to periodically inspect flows, as needed, for odors or other visual indications of potentially illicit discharges at various MS4 locations on campus.	• UNM will perform field screening as weather allows.		

Table 7.1
Storm Event Discharge Monitoring

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.7.c.(2)	• The co-permittees will work to ensure that the program is accomplishing the goals of identifying sources of pollution introduced into the MS4.	• The co-permittees will assess storm event discharge monitoring data collected and benchmark against local or other storm water databases. • The co-permittees will set priorities for addressing data results. • The co-permittees will work together on the assessment of storm event discharge monitoring results in the annual report.	Safety and Risk Services (SRS)	December 20, 2002

Table 7.2 Monitoring Programs – Wet and Dry Weather	
Permit Citation	**Plan/Additional Information**
Part 2.5.7.c.(1)	Included in Appendix O is a matrix of monitoring Outfall Descriptions
Part 2.5.7.c.(1)	Included in Appendix P is a copy of the Table 5.1.1.a (1) and (2) of monitoring points.
Part 2.5.7.c.(2)	Included in Appendix K is a copy of the NPDES STORM WATER FIELD SCREENING SAMPLE LOG. .

SECTION 8. SPILL PREVENTION AND RESPONSE

Table 8.1
Spill Prevention and Response

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.8.a	• UNM will continue to review and revise current safety procedures that address Spill Prevention and Response. The objective of the above is primarily to prevent leaks and or spills and, secondly, mitigate discharges to the MS4 as a result of spills or leaks.	• Current SRS safety manual addresses the following topics: a. minimum chemical storage and handling requirements b. UNM Spill Response procedures c. coordinated response agencies outside of UNM d. Establishment of notification and emergency preparedness procedures e good housekeeping procedures f. reporting and documentation procedures g. training procedures h. emergency procedures	Safety and Risk Services (SRS)	May 16, 2005
	• The purpose of the spill prevention and response program is to prevent and safely response to chemical spills on UNM property. This is intended to protect the faculty, staff, students, visitors from the hazards of chemical spills on campus.	• UNM will revise and review requirements and practices to ensure that they are the most effective.		

Table 8.1
Spill Prevention and Response

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.8.a (cont)	• The SRS Chemical Spill Response Program provides specific procedures on mitigating and responding to exterior spills (specifically addressing storm water pollution) as soon as possible, especially if precipitation is occurring or appears imminent	• Spill Prevention. a. Aboveground containers (>55 gallons) of regulated liquids are protected from vehicle collision by barriers, (e.g., bollards, fencing, or buildings), and or are constructed with secondary containment. b. Loading/unloading operations for large volumes (>25 gallons) of regulated liquids and solids are done under done within covered/roofed areas and or the direct observation of experienced technicians on installations equipped with spill and overfill protection equipment.	Safety and Risk Services (SRS)	May 16, 2005

Table 8.1
Spill Prevention and Response

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.8.a (cont)		• Spill Mitigation a. Spilled material, if possible, will be safely neutralized, will be done. b Storm inlets will be diked with soil or absorbents pigs to minimize regulated liquid discharge into the MS4 c Spilled regulated liquids, e.g., petroleum-based automotive fluids, will be removed from hard surfaces with absorbents,, or from porous surfaces by excavation for large quantities, or by enhanced bioremediation (e.g., spraying on MicroBlaze™) on soils or other porous surfaces d. Spilled solids, (e.g., Portland Cement) will be swept up off of hard surfaces or scraped off of soft surfaces. • All recovered spilled materials and absorbents will either be beneficially reused, recycled or be properly disposed.	Safety and Risk Services (SRS)	May 16, 2005

Table 8.1
Spill Prevention and Response

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.8.a (cont)		a. Spill Response a. If the spill is small and not particularly hazardous, the spiller is required to self-respond, and or to call SRS for assistance. b. If the spill is large and/or potentially hazardous, the spiller is required to immediately contact SRS. Then SRS, depending on the spill size and degree of hazard will respond to the spill with internal staff, and or contact the Albuquerque Fire Department., and or contact an on-call spill response contractor. c. The responding party (SRS, Fire Department, or contractor) will make the required initial verbal notifications to the EPA, NMED, etc. SRS will produce and send any required written follow up reporting.	Safety and Risk Services (SRS)	May 16, 2005

Table 8.2 Spill Prevention and Response	
Permit Citation	**Plan/Additional Information**
Part 2.5.8.a	Included in Appendix Q is a copy of the SRS Safety Manual Spill Prevention and Response section.

SECTION 9. PUBLIC EDUCATION AND OUTREACH ON STORM WATER IMPACTS

Table 9.1
Public Education and Outreach on Storm Water Impacts

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.9.a and b, 2.5.10 f	• To enhance public awareness, UNM has implemented several measures.	• Storm Water Team (a consortium of regional water authorities within the Rio Grande basin who are dedicated to outreach and the public on how to reduce storm water pollution by keeping trash and other pollution out of the storm water system. a. member and active participant in funding and directing associated media campaign, website, etc. b. Meet with public and media groups regarding environmental concerns. c. Publicize in the Area media d. Invite the support of the public to mark storm inlets with warnings such as, or similar to, "DRAINS TO RIVER" and "DO NOT DUMP". e. Attend Middle Rio Grande Water Quality Working Group meetings which are open to the public. f. Provide storm water pollution prevention automotive information to faculty, staff, students, and visitors who register for a UNM parking permit.	Safety and Risk Services (SRS)	September 16, 2008

Table 9.1
Public Education and Outreach on Storm Water Impacts

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.9.a and b, 2.5.10 f (cont)		g Provide storm water pollution prevention presentation to UNM Building Coordinators meeting. h. Advertise storm water pollution prevention information in the UNM campus media. i Advertise storm water pollution prevention information in the UNM SRS newsletter, a department newsletter made available to faculty and staff either by campus mail or on our department website		
			Safety and Risk Services (SRS)	September 16, 2008

Table 9.1
Public Education and Outreach on Storm Water Impacts

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.9.i	• Maintain a public information hotline (277-2753 at SRS) to facilitate the reporting of illicit discharges and spills. • Education Activities for proper public management (non-university) of oil and toxics and opportunities to recycle motor fluids are done in conjunction with the City of Albuquerque programs.	• Illicit discharges are managed as emergencies. Any person who becomes aware of an illicit discharge is encouraged to contact UNM Campus Police or SRS. • Steps for reporting Illicit discharges: a. Spills are reported directly to UNM Campus Police 1. Campus Police may be reached at 911 on any campus phone and 277-2241 on any non-campus phone. 2. In the event that someone dials 911 from a non-campus phone, the Albuquerque Fire Department will notify UNM Campus Police. b. Campus Police contact the SRS Duty Officer who is on call on a 24/7 basis. c. The Duty Officer will to contact the appropriate SRS subject matter expert who can best assist the authorities (e.g., Fire Department) for properly responding to the incident Depending on severity, AFD may still elect to respond to the emergency	Safety and Risk Services (SRS)	May 16, 2005

Table 9.1
Public Education and Outreach on Storm Water Impacts

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.9.i (cont)		d. Household hazardous wastes are disposed of free Hazardous Waste Collection Center operated by Rinchem Company, Inc.(6133 Edith Blvd NE, Albuquerque). 1. Information at: Albuquerque Environmental Health Department at (505) 768-2600 or the Rinchem Household Hazardous Waste Collection Hotline at (505) 345 1650. 2. Information on automotive fluids recycling at the Albuquerque Environmental Health Department at (505) 768-2636. 3. The Albuquerque Environmental Health Department website http: www.cabq.gov/envhealth 4. The Albuquerque Solid Waste Management Department website for recycling and disposal opportunities. http:, www.cabq.gov solidwaste.	Safety and Risk Services (SRS)	May 16, 2005

Table 9.2 Public Education and Outreach on Storm Water Impacts	
Permit Citation	**Plan/Additional Information**
Part 2.5.9.c	Included in Appendix R is a copy of the certification of the review of the Public Education and Outreach on Storm Water Impacts Program
Part 2.5.9.c	Appendix R copy of storm water from SRS web

SECTION 10. PUBLIC INVOLVEMENT AND PARTICIPATION

Table 10.1
Public Involvement and Participation

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.5.10.a and b	• UNM Public Participation in the Storm Water Management Program will • be accomplished through involvement in several forums The Albuquerque MS4 co-permittees can assure that • all State, Tribal and local public notice requirements compliance. 1. Middle Rio Grande Water Quality Standards Work Group 2. City of Albuquerque Development Process Manual (DPM) Review Process 3. Water Quality Monitoring 4. Storm Water Related Training and EPA Conference Calls	These goals apply to co-permittees. • Have a representative present at Middle Rio Grande Water Quality Standards Work Group (MRGWQSWG) meetings with content that is relevant to UNM's MS4. • Share UNM's storm water related information with the MRGWQSWG and EPA Conference Calls when requested or appropriate. Participate in EPA Conference Calls when possible • Comply with storm water quality requirements in the Albuquerque DPM. • Participate in at least one local storm water related training sessions a year if offered locally by either the EPA, New Mexico Environment Department (NMED), or CABQ. • As needed, conduct storm water pollution prevention training for targeted campus entities.	Safety and Risk Services (SRS)	September 16, 2008

Table 10.2 Public Involvement and Participation	
Permit Citation	**Plan/Additional Information**
Part 2.5.10.a and b	Included in Appendix S is a copy of the Storm Water Team agreement
Part 2.5.10.a and b	Included in Appendix S is a copy of the Storm Water Team brochure

SECTION 11. BACTERIAL TMDL, TOXICITY, AND DISSOLVED OXYGEN MONITORING PROGRAMS

Table 11.1
Bacterial TMDL, Toxicity, and Dissolved Oxygen Monitoring Programs

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.6.1.0 and 2.6.1.1	• UNM works and supports the co-permittees in the Bacteria Total Maximum Daily Load (TMDL) program.	• UNM will work with co-permittees to review existing list of potential categories of bacteria sources by watershed and watershed density as well as the legal authority. • UNM will work with co-permittees will review existing dry weather field investigation program to potentially reduce or eliminate bacteria sources. • UNM will work with co-permittees to try to submit results one month prior to compliance date.	Safety and Risk Services (SRS)	December 20, 2002
Part 2.6.1.2 and 2.6.1.3	• UNM works and supports the co-permittees in the Bacteria TMDL wet and dry investigation program to address concerns regarding any potential sanitary sewer main leakage and leaking for low, moderate, and high density watershed. • UNM has no septic tanks	• UNM will work and support the co-permittees, contributing financial and labor as necessary to analyze collected data to try to submit results two months prior to compliance date.		

Table 11.1
Bacterial TMDL, Toxicity, and Dissolved Oxygen Monitoring Programs

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.6.1.2 and 2.6.1.3 (cont)		• UNM conducted a study of the sanitary sewer system ("University of New Mexico Sewer Collection Study Final Report") which showed that the sewer system was adequate for present and future uses • Based on the report UNM will continue to endeavor to: a. replacing cracked manhole lids b. adjusting manhole rim elevations c. repairing connections between sewer pipes and manholes d. develop a manhole inspection program consisting of: 1 Check the system geometry and confirm locations of manholes and pipe network routing; 2 Identify and investigate the conditions of the existing sewer system on campus;	Safety and Risk Services (SRS)	January 2001
		3. Inspect sources of possible Infiltration/Inflow (I/I) to the system 4. Develop maintenance and rehabilitation methods to solve any sewer system problems • Following the Manhole inspection UNM will use Internal Closed Circuits Television (CCTV)		

Table 11.1
Bacterial TMDL, Toxicity, and Dissolved Oxygen Monitoring Programs

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.6.1.2 and 2.6.1.3 (cont)		• UNM performed a major MS4 cleaning • UNM then performed a video inspection in a majority of UNM's MS4 on Main Campus.	Physical Plant (PPD)	September 2007
Part 2.6.1.4 and 2.6.1.5	• UNM works and supports the co-permittees in the Bacteria Reduction and Treatment program for low, moderate, and high density watershed	• UNM will work and support the co-permittees, contributing financial and labor as necessary to analyze and QA QC collected data to try to submit results six months prior to compliance date.	Safety and Risk Services (SRS)	December 20, 2002
Part 2.6.1.7	• UNM works and supports the co-permittees in the Prevention of Future Bacteria Discharge program for low, moderate, and high density watershed.	• UNM will work and support the co-permittees, contributing financial and labor as necessary to analyze and QA QC collected data to try to submit results six months prior to compliance date.		
Part 2.6.1.7	• UNM works and supports the co-permittees in the Monitoring to assess the BMPs effectiveness and compliance with Bacteria TMDL.	• UNM and the co-permittees utilize the USGS for sampling and will analyze this data to support comparison for effectiveness and compliance of the Monitoring program. • UNM will support and work with the co-permittees to try to ensure that the measurements stay within the limits of the loading values (Appendix 1) and reported on Discharge Monitoring Report (DMR) forms.		

Table 11.1
Bacterial TMDL, Toxicity, and Dissolved Oxygen Monitoring Programs

Permit Citation	BMPs	Measurable Goal (s)	Responsibility	Target Date for Achievement/ Implementation
Part 2.6.2.f.(3)	• UNM will work with the co-permittees to gather and evaluate toxicity tests. If necessary UNM will work with the co-permittees to develop actions that would minimize any problematic toxicity found.	• UNM will work with co-permittees to find suitable and successfully sampling methods and an approved lab to gather the results	Safety and Risk Services (SRS)	2014
Part 2.6.2.g	• UNM will work with the co-permittees to provide support for toxicity studies as determined by the co-permittees.	• UNM will work with co-permittees to find suitable and successfully sampling methods and an approved lab to gather the results		
Part 2.6.3.g	• UNM will work with the co-permittees to provide support studying dissolved oxygen as determined by the co-permittees.	• UNM will work with co-permittees to find suitable and successfully sampling methods and an approved lab to gather the results.		

Table 11.2 Bacterial TMDL, Toxicity, and Dissolved Oxygen Monitoring Programs	
Permit Citation	**Plan/Additional Information**
Part 2.6.1.7	Included in Appendix T is a copy of Numeric Target Values for Storm Water Conveyances
Part 2.6.1.9	UNM and the co-permittees will submit BMP evaluations, assessments.
Part 2.6.1.7	Included in Appendix T is a copy of Numeric Target Values for Storm Water Conveyances
Part 2.6.1.11	Included in Appendix T is the TMDL report from 2007

SECTION 12. CONTACT INFORMATION

Table 12 Contact Information				
Name	**Title**	**Department**	**Telephone**	**Email**
David Harris	Executive Vice President	Business Finance Administration Office	505 277-7520	dwharris@unm.edu
Mary Vosevich	Director	Physical Plant (PPD)	505 277- 6644	mvosevic@unm.edu
Bob Notary	Associate Director	Physical Plant: Engineering (PPD)	505 277-3569	notary@unm.edu
R. Gary Smith, Ph.D.	Associate Director	Physical Plant: Environmental Services (PPD)	505 277- 2413	rgsmith@unm.edu
Willie West	Manager	Physical Plant: Grounds and Landscaping (PPD)	505 277- 0615	wwest@unm.edu
Donna Smith	Director	Safety and Risk Services (SRS)	505 277-9794	donnas@unm.edu
Joel Straquadine	University Safety Officer	Safety and Risk Services (SRS)	505 277-5488	jstraqua@unm.edu
Vernon Hershberger	Environmental Health Manager	Safety and Risk Services (SRS)	505 277-9756	hershber@unm.edu
Claudia Miller	Planner	UNM Department of Planning and Campus Development	505 277-9202	csmiller@unm.edu
Michael Reid	Group Manger, Project Construction	UNM Office of Capital Planning (OCP)	505 277-6444	mreid@unm.edu
Clovis Acosta	Director ,Parking & Trans Services	UNM Parking Services	505 277-9557	cacosta@unm.edu
Christine Chester	Police Commander	UNM Police Department	505 277-1935	cchester@unm.edu
Tom Weeks	Associate Director Procurement	UNM Purchasing Department	505 277-2036	tomweeks@unm.edu
Kimmerly Kloeppel	Vice President Student Affairs	UNM Student Affairs	505 277-0957	kimmerly@unm.edu
David Harris	Executive Vice President	Business Finance Administration Office	505 277-7520	dwharris@unm.edu

APPENDIX A: COOPERATIVE AGREEMENT

AGREEMENT IN PRINCIPLE

This agreement is entered into between the City of Albuquerque, a New Mexico municipal corporation (City), and the University of New Mexico, a New Mexico public educational institution, this 26th day of March, 1997.

The parties involved do hereby agree to be co-permittees under a Storm Sewer System (NPDES Permit) as required for Municipal Separate Stormwater Sewer Systems (MS4s), and will work towards completion of a Joint Powers Agreement.

FOR THE UNIVERSITY OF NEW MEXICO:

Steven G. Stokes — Date
Vice President for Business and Finance

Chester N. Estes — Date
University Counsel

FOR THE CITY OF ALBUQUERQUE:

Robert D. Durkin — Date
Director of Public Works

Lawrence Rael — Date
Chief Administrative Officer

APPENDIX B: OPERATOR EDUCATION AND TRAINING PROGRAM AND NPDES TRAINING CERTIFICATES

CONTRACT REVIEW FORM

Last Revised: 12/08/99

The employee initiating the contract should complete the appropriate sections of this form, and send it with the contract to the appropriate contract review officer for processing (see reverse side for the location of contract review officers). To the extent the initiating employee does not understand the proposed contract, or is uncomfortable with any of its provisions, he or she should note that information on the Contract Review Form or attach an explanatory memo.

Certificate of University Employee Initiating Contract

Parties to the Contract: U.S. Environmental Protection Agency (EPA) and UNM

Date: November 22, 2004

Short Description: UNM certification on implementation of both a Operator Training + Education Program and a Pesticide, Herbicide + Fertilizer Mgmt Program as req'd by UNM's Stormwater Permit from EPA.

Contract Term: Indefinate Amount: Within existing SHEA + PPD Funding

Except as indicated in any attached memorandum: I have read this contract entirely, understand all its provisions, believe that it meets programmatic and UNM mission requirements, believe that it represents a good deal for the University, and take responsibility for complying with the terms of the contract. The document is internally consistent and clear. I am also satisfied with the description of the University's obligations and with the description of any goods or services to be provided by or to the University. Any risk management concerns have been reasonably addressed. A memorandum ✓ is ___ is not attached. To the extent the contract requires an outlay of funds, the funds are available. I either have the authority to obligate the funds or have attached approval from someone who does.

Compliance with this contract will require the cooperation of, or otherwise impact on, the following departments or positions:

Safety, Health + Environmental Affairs (SHEA)

Physical Plant Dept. (PPD)

November 22, 2004 / Ecological, Chemical + Environmental Affairs Mgr.

Date/Signature/Position Larry Watson

Dean (Academic) or Director (Staff) Certificate (if above party is not a Dean or Director)

I concur with the above certification.

November 22, 2004 / Interim Director, SHEA

Date/Signature Jim DeFelter

Contract Review Officer Review

I have reviewed this contract and it does not contain any legally prohibited provisions, includes all legally or administratively required provisions, is basically consistent and clear, and is not otherwise objectionable on legal or administrative grounds, to the best of my knowledge and abilities. I have indicated below any other reviews necessary prior to execution of this contract.

_____ / University Counsel

Date/Signature/Position Charles N. Estes, Jr.

_____ Recommend Additional Review (see page 2)

OPERATOR EDUCATION & TRAINING PROGRAMS
for
STORMWATER POLLUTION PREVENTION AT UNM

Preface

The University of New Mexico (UNM) endeavors to be a good neighbor to our community and the natural environment. To that end, UNM strives for proactive and cost-effective solutions to minimize impacts to our community and the environment.

Consistent with those goals, UNM continues to educate & train internal staff on storm water pollution prevention (SWP2) techniques and requirements. UNM employs outside contractors and design professionals who are already proficient with incorporating SWP2 into their work for UNM.

The following attempts to document UNM's ongoing and evolving SWP2 education & training efforts regarding our construction sites and our operations & maintenance efforts. As desired by all involved, including the EPA, this program is not cast-in-stone, and will be periodically modified in order to allow future improvements.

I. CONSTRUCTION SITES

Construction activities often involve disturbance of soil, pavement or external building surfaces and/or storage & application of new materials & debris that could be washed off-site by storm water. Techniques and controls are employed to minimize the potential for off-site impacts. Construction techniques and control technologies continue to develop and improve, and this drives the need for periodic training and/or information updates for all parties involved. A description of the existing and anticipated training & education programs for the various parties involved with SWP2 at UNM construction sites is outlined below.

A. Construction Project Inspectors

UNM's Department of Safety Health & Environmental Affairs (SHEA) and the Physical Plant Department (PPD) both have construction project inspectors. The SHEA and PPD inspectors have different primary roles in their construction inspection work. Regardless, construction project inspectors will continue to be the first line of defense if outside contractors are not keeping up with SWP2 requirements.

1. Existing Training

One SHEA inspector, Dan Byrne, and one PPD inspector, Michael Reid, both attended South Sandoval County Arroyo Flood Control Authority's (SSCAFCA's) "Stormwater

Quality BMP Training for Contractors and Developers" on January 29, 2004. Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA), City of Albuquerque Public Works Department (COAPWD), and SSCAFCA personnel, who represent the largest storm water management entities in our geographical area, taught this comprehensive 8-hour class. The class covered the construction-related Best Management Practices (BMPs) contained in the "NPDES Manual: Stormwater Management Guidelines for Construction and Industrial Activities", a.k.a., the "BMP Manual". The BMP Manual was locally co-developed by New Mexico Department of Transportation (NMDOT), COAPWD and AMAFCA. This BMP manual has become the construction industry standard for SWP2 BMPs across a majority of New Mexico. SWP2 training certificates have been issued to these two UNM construction site inspectors, and copies of such are included in Appendix A.

2. Anticipated Future Training

By virtue of UNM being a copermittee with AMAFCA, COAPWD and NMDOT, UNM participates in the area's "Cooperative Training Sessions for Contractors in the Implementation of Storm Water Pollution Prevention Plans". Therefore, appropriate UNM personnel, such as UNM's inspectors, will be notified & encouraged to attend future local classes free of charge. We anticipate that UNM construction site inspectors will continue to avail themselves of these classes, and/or perhaps other SWP2 classes/conferences of interest to them, at least once every 2 years.

B. Architect/Engineer SWP2 Design Information for Design Professionals

Copies of the local BMP Manual have been distributed to the following departments:

- Department of Facility Planning (DFP), Main Campus;
- Department of Facility Planning, Health Science Center; and,
- Physical Plant Department (PPD).

These copies are provided for reference for both UNM's internal design professionals and for loaning to the external design professionals that UNM retains. The intent is that these design professionals will continue using this information to incorporate SWP2 controls and techniques into both the construction phase and finished product on new facilities.

Additionally, UNM only employs and contracts with qualified design professionals who regularly engage in profession development opportunities to maintain their credentials. Engineers must earn CEUs to maintain their PE registrations, and similarly for architects to maintain their AIA credential. Such design professional organizations keep their constituencies apprised on a wide variety of topics, including SWP2 as of late.

Furthermore, SHEA will give a group presentation to UNM's internal facility project managers and design/planning professionals, focusing on their SWP2 issues and contributions, at least once a year.

C. Construction Contractors

UNM holds contractors responsible for their management of storm water in accordance with the site SWPPP. Therefore, construction contractors working on campus should continue to be motivated to pursue training & education and staff our projects with qualified personnel. Upon their request, contractors will be provided a copy of the BMP Manual and/or the pocket-sized BMP Manual Pocketbook from SHEA, DFP or PPD.

Local branches of construction contractor organizations, such as the AGC and ABC, have been informing their constituents, and have encouraged them to attend the "Stormwater Quality BMP Training for Contractors and Developers" class and other similar short courses or conferences containing SWP2 content. UNM will encourage our construction contractors to attend the "Cooperative Training Sessions for Contractors in the Implementation of Storm Water Pollution Prevention Plans" that will continue to be offered locally.

D. EH&S Office

The Department of Safety, Health & Environmental Affairs (SHEA) oversees UNM's compliance with all environmental, health & safety (EH&S) requirements on campus, including SWP2.

SHEA staff review & comment on the plan & specs for projects under design that disturb greater than 1 acre of soil or pavement. SHEA will update the DFP & PPD departments when the BMP Manual is revised. As the second line of defense, SHEA will continue to pursue corrective action for any storm water issues, if not resolved by initial construction project inspector communication to the construction project management team.

To remain trained & educated on the most current SWP2 issues, SHEA's Environmental Health Manager will continue to regularly read the "*Environmental Reporter*" weekly periodical published by BNA, Inc. The *Environmental Reporter* tracks regulatory & technical developments in the EH&S profession, including SWP2. Additionally, the Environmental Health Manager, or his/her designee, will do the following to remain educated & trained on SWP2 issues:

- Attend periodic New Mexico Society of Hazardous Materials Mgrs. Meetings; and,
- Attend a class, or conference with SWP2 content at least once every 2 years.

II. OPERATIONS & MAINTENANCE ACTIVITES

Operations & maintenance (O&M) personnel use materials and conduct activities, such as painting, water treatment, vehicle maintenance, litter control, etc., which could potentially impact storm water quality on campus. Therefore, the appropriate personnel will be trained on SWP2 issues and techniques beginning in Fiscal Year '04-05.

At this time, the training program consists of a half-hour to an hour-long session covering the "*Storm Warnings*" SWP2 video and other training materials developed by Excal Visual, Inc. The discussion is focused on their particular work processes that could potentially impact storm water. If time allows, a brief written quiz is given to the employees to record & monitor the effectiveness of the training. A sign in sheet with the names of those attending the training session will be retained at SHEA.

The following groups of O&M-related employees are and will be offered training:

- PPD Ford Utilities;
- PPD Landscaping & Grounds;
- PPD Remodel Section;
- PPD Area 1;
- PPD Area 2;
- PPD Area 3;
- PPD Area 4; and,
- PPD Automotive.

At this time, depending on the results of the written quizzes, we anticipate that this training will be re-offered annually.

When notified that a key new employee has been hired whose work may have a high potential to impact storm water, then SHEA will provide appropriate specialized training within 2 months of the notice.

III. PROGRAM IMPLEMENTATION CERTIFICATION

I am an authorized representative, as described in Appendix G, Subsection 11 of the NPDES General Permit.

I certify that the University of New Mexico (UNM) will continue to implement operator education & training programs as described above in this program. To continue to improve the efficiency & effectiveness of this relatively new program, UNM anticipates changes to it periodically in the future. All such changes will be compliant with NPDES regulations and consistent with storm water pollution prevention goals.

I certify under penalty of law that this program and attachments were prepared under my direction or supervision in accordance with a system designed to assure the qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

David W. Harris

David W. Harris
Executive Vice President for Administration

1/24/04
Date

Appendix A

BMP Training Certificates
for
UNM Construction Project Inspectors

NPDES
TRAINING

Certificate of Attendance

DAN BYRNE

Stormwater Quality BMP Training for Contractors & Developers

SOUTHERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY (SSCAFCA)

David Stoldet, PE Executive Director Date

SSCAFCA

NPDES
TRAINING

Certificate of Attendance

MIKE REID

Stormwater Quality BMP Training for Contractors & Developers

SOUTHERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY (SSCAFCA)

David Stolikes, P.E. Executive Director Date

APPENDIX C: DESIGN STANDARDS SPECIFICATIONS

OVERVIEW

This document is offered to the Design Teams for information and guidance. It will be used by The University of New Mexico, PPD-Engineering and Energy Services as a guideline for submission review.

These standards are not intended to be all-inclusive but are intended to highlight specific UNM requirements and concerns. Applicable items shall be addressed at the appropriate submission phase. All designs are expected to meet or exceed code requirements and follow good professional practice.

For convenience, this document is organized using the CSI Master Format 2004 Edition Numbers & Titles. Designers and consultants are therefore expected to supply specifications and submittals in accordance with that format.

THE UNIVERSITY OF NEW MEXICO
DESIGN STANDARDS
Physical Plant Department - Engineering & Energy Services Division

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DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

00 70 00 Conditions of the Contract

00 72 00 General Conditions

Include the UNM General Conditions and an edited version of Division 00 as part of the contract.

DIVISION 01 – GENERAL REQUIREMENTS

01 11 00 Summary of Work

1. Describe unusual project work, such as extensive utility relocations, contractor licensing requirements, etc.

01 11 16 Work by Owner

1. UNM PPD Utilities personnel are the only parties authorized to operate UNM utilities equipment. This includes all devices connected to piping and primary electrical distribution systems such as valves, switches, pumps, breakers, etc. Any party that requires operation of a UNM utilities device must coordinate that operation through the UNM project manager.

01 30 00 Administrative Requirements

1. Verify that all floor plan base sheets match Architectural plans
2. Verify that column gridlines, room numbers, key plan, necessary labels are indicated on appropriate plans
3. New work shall be adequately delineated/differentiated from existing facilities (line width, symbols, etc.)
4. Duplication of information is to be avoided, i.e., same information shown in two different places, in different scales, etc. More or less duplicate plans are to be avoided. Try to economically use all parts of drawing sheets. "D" size drawings are preferred.
5. Indexes shall match actual documents.
6. Legends shall be appropriate for project and correct.
7. Provide title strip along right vertical margin with lettering at least ¼" high.

01 10 00 Summary

1. Future work – are appropriate mechanical, electrical and IT rough-ins being provided for any future items?
2. Owner Furnished Products –include primary pad-mount switch and primary pad-mount transformer, if applicable.

01 21 00 Allowances

Schedule of Allowances - discuss if appropriate to include allowances for unknowns, such as utility relocations, additional SFM requirements based upon their final inspection, etc.

01 29 00 Payment Procedures

Schedule of Values- Contractor MUST include a separate "Project Closeout" line item for each project. Contractor will not be paid any amount on this line item until all closeout items have been completed (e.g., training, O&Ms, as-builts, etc.)

DESIGN DOCUMENT SUBMITTAL REQUIREMENTS

This document outlines the general requirements and scope for project design phase document submission. It will be used by UNM PPD-Engineering and Energy Services as a guideline for submission review. This document is offered to the Design Teams for information and guidance.

Program Phase

1. Provide a written description of the project from the Programming phase. It is especially helpful if any unusual or special criteria, particularly those relating to Mechanical, Electrical, Civil and Structural engineering are identified
2. The Owners Project Requirements (OPR) should be defined at this time and submitted to the design team.
3. Identify systems which are to be commissioned.

Schematic Design Phase

It is expected that the following listed issues will be responded to in the Schematic Design submission. This submission shall also address the applicable technical items as listed on the technical design checklists.

1. Written description of the Plumbing, HVAC, HVAC Controls, Electric Power, Lighting, Sprinkler and Special Systems that are intended for the project, particularly and unusual or special features. This document will comprise the Basis of Design (BOD) document needed for commissioning activities.
2. Written description of soils conditions and anticipated foundation requirements and design plan. Include report from geotechnical engineer to support this description.
3. Preliminary Site Utility Plan indicating sanitary sewer ~~disposal~~, storm drainage, domestic water, gas, electric power, fire protection, chilled water, steam, exterior lighting, telecommunications, IT and special systems intended for the project. Clearly indicate points of connection to existing systems.
4. Indicate current existing site drainage pathways including offsite drainage entering the site and analysis of basic drainage through site. . All drainage calculation must use the City of Albuquerque's DPM Section 22.2. These calculations must be available for review on a separate drawing or section in the submittal. The calculations must include the existing condition as well as the proposed conditions for the 100 year storm and a 20 year storm.

5. Statement outlining the Mechanical/HVAC Design Criteria to include winter and summer design temperatures, degree days, outside air and ventilation requirements, filtration requirements, humidity requirements, exhaust criteria, noise criteria and any other significant design requirements.
6. Statement outlining the Electric Power Design Criteria to include voltages, grounding, special power quality requirements, lighting levels and any other significant design requirements.
7. Statement that UNM Standards and Design Criteria will be incorporated into the design of the project. Statement that UNM HVAC design standards will be incorporated into the project. Conflicts and conditions not covered by the UNM Standards should be clearly noted for resolution at this phase.
8. Statement that LEED Silver Green Building design criteria shall be incorporated into the design, and the initial LEED scorecard showing which credits will be attempted.
9. Preliminary block (building) heating and cooling loads. Preliminary estimates for yearly energy consumption and energy costs using current rates.
10. Preliminary total building energy budget in BTUs per year.
11. Proposed design and construction schedule
12. Define any known unusual conditions that might affect design or construction.

Design Development Phase

1. Final floor plans.
2. At this stage, all important HVAC and Electric design decisions shall be made. The DD submission shall define the main systems to be incorporated within the project and how they coordinate with other design requirements and the architecture and structure. Details and all sizes need not be included but enough design must be shown to insure the system and distribution plan is clearly defined. Significant main distribution systems should be sized to be sure they fit and allow access for maintenance.
3. Proposed electric power riser and one-line diagram indicating service, new service equipment, generator, etc. Include a preliminary building electrical load calculation (connected & demand) and transformer size.
4. Updated HVAC design criteria where appropriate when changes from the schematic submission occur or when criteria are added. The design criteria for specific spaces, i.e. classrooms, labs and the like should be defined.
5. Heat loss and heat gain calculations for all spaces and verification of the estimates for yearly energy consumption and energy costs using current rates. Also verify the total building energy budget in BTU's per year.
6. ~~Preliminary Electric Service size calculations, loads, estimated demands, etc.~~
7. Major duct layout, sizes and verification that space is adequate for congested areas, duct crossing, coordinates with other facilities and construction, etc.

8. Major piping layout, sizes and verification that space is adequate for congested areas, coordinates with other facilities and construction, etc.
9. Mechanical and Electric room layout with sufficient space and access to equipment for maintenance.
10. Start of Equipment Schedules including not less than equipment identification, location and major sizes and capacities
11. Further development of the Site Utility plans including all connection points, including but not limited to steam, chilled water, electric, gas, water and sanitary sewer.
12. Proposed construction fencing and contractor laydown area(s). Address contractor access to/from site, maintaining pedestrian/ADA access, etc.
13. Proposed drainage plan shall include all drainage whether generated on site or not.
14. Outline Specifications to include suggested deviations from UNM standards or unusual concepts.
15. All critical information that the owner will need for equipment and material replacement shall be incorporated on the drawings and not buried in the spec books. This includes but is not limited to:
    - Window schedules with thermal & solar performance
    - Climate assumptions
    - Sequences of operation (HVAC & lights)
    - DDC points lists
    - Envelope thermal properties
    - Clear indication of floor loading capacities.
    - DDC sensor locations (duct static pressure, outside air, etc.)
    - Electrical panel schedules
    - Light fixture schedule
16. More developed LEED scoresheet and confirmation of which LEED system (e.g., New Construction, Commercial Interiors, etc.) will be used for certification.

<u>50% Construction Documents</u> (in addition to the above requirements).

1. Floor plan layout for power, telecommunications and mixed media devices.
2. Floor plan layout for Lighting
3. Complete electric service design and all panel locations.
4. Start of light fixture schedule (all fixture types generically described).
5. Preliminary riser diagrams.
6. Final grounding scheme and solutions to power quality issues.

7. Generator if required
8. Duct layout including all terminal units, valves, sectioning valves, balancing valves, etc.
9. Piping layout including all terminal units with CFM, dampers, etc.
10. Advanced composite equipment room and equipment layouts, including roof top units.
11. More complete mechanical schedules
12. Finalization of design criteria.
13. Substantially complete schematic diagrams
14. Initial controls diagrams with start of sequence of operation.
15. HVAC detailed calculations indicating design parameters, minimum and maximum air flows.
16. Final summary of utility loads (gas, water, steam, chilled water and electric power)
17. Indicate the final anticipated energy costs and energy consumption.
18. Final site utility plans with sizes, connection points, valves, vaults, major equipment items, etc. Start of details.
19. Complete index in project manual. Not less than 50% complete specifications including parts for all divisions. Division 1 should be essentially complete, containing special interest items; UNM assistance needed for this.
20. Proposed drainage topographic drawings shall be complete with critical spot elevations specified and cross-section volumetric flow analysis completed. Drain pathway arrows shall be included.
21. P&ID diagrams for all air and water systems clearly showing system components, flow paths and sensors.

<u>95% Construction Documents</u>

1. Essentially Complete Drawings and Specifications.
2. Complete details
3. Complete HVAC control diagrams with sequence of operation.
4. Final short circuit and coordination calculations.
5. DDC control panels shall be either UL listed or shop drawings stamped by a licensed engineer.
6. Laydown yards and staging areas to accommodate construction. All phasing and sequencing issues addressed.
7. Final LEED scorecard.

Addenda

Provide the opportunity for PPD Engineering to review and contribute to addenda

POST CONSTRUCTION

Provide as-built drawings which have included the contractor's field mark-ups. This shall be transmitted to the Construction Manager in AutoCAD format with a courtesy copy to UNM PPD Engineering & Energy Services along with soft-copy specifications and requested submittals.

01 35 00 Special Procedures

Smoking is prohibited in UNM buildings, including those under construction.

01 35 23 Owner Safety Requirements

1. ~~The design team is required to obtain a copy of the SRS (Safety & Risk Services) Environment, Health and Safety Guidelines and incorporate appropriate items in the Project Manual and Construction Drawings.~~ Contractor shall comply with applicable federal, State and local statutes and regulations relating to environmental health and safety.
2. Indicate that it is the General Contractor's primary responsibility to ensure that all sub-contractors comply with all safety issues. Also note that the Contractor is fully responsible for having an Environmental, Health and Safety compliance program that is acceptable to UNM SRS and applicable regulatory agencies. The Contractor shall affirm, in writing, that all entities working on the project have in place and in operation such programs prior to representatives entering the project site.
3. Any fines or citations issued to the University that were the result of any action or inaction by any contractor, sub-contractor or others working on the project, shall be the responsibility of such contractor, subcontractor or others. Moreover, such contractor, subcontractor or others shall reimburse the University for all expenses associated with such action or inaction.
4. For any work areas that are posted as biohazardous, the UNM Biosafety Officer (272-8001, alternate 277-5488) must be contacted for clearance prior to start of work.
5. All persons performing electrical work at UNM must use and adhere to UNM "Lock-out Tag-out" policies.
6. The contractor will be responsible for providing an on site welding permit system according to OSHA 29CFR1926 and NFPA 51B. The contractor will ensure that all welders are properly trained and certified in the specific type of equipment they are to use on the project. The contractor will ensure that welding operations do not occur when other fire hazard situations exist in their area, other hazardous operations are in process or flammable liquids are in the area
7. When exposure to gases, fumes, vapors or dust may exceed the OSHA PEL, the contractor shall be responsible for the establishment and maintenance of a respiratory protection program. All respirators shall be approved by NIOSH and shall be suitable for the airborne hazards at the worksite. Self-contained breathing apparatus must be worn when employees work in an oxygen-deficient atmosphere. Appropriate respiratory protection is required for painters during spraying operations
8. Smoking is prohibited within 50 feet of any paint spraying operations. Paint spraying operations are prohibited in confined spaces.

9. Hearing protection is required when employees use tools and equipment which produce noise in excess of 85 dBA and would require the contractor to manage a Hearing Conservation Program. This program would require training, provision of a selection of hearing protectors, audiometric testing and noise monitoring.
10. The contractor is responsible for ensuring proper usage of personal protective equipment. All workers within the construction site or area must wear personal protective equipment at all times, including hard hats, eye protection, safety shoes, and protective clothing (long pants and shirts with sleeves covering the shoulders at a minimum). Workers must use additional protective gear, such as ear protection, respirators, face protection (shields), and gloves, as appropriate.

01 35 43 Environmental Procedures

1. Chemical Safety - All hazardous materials and wastes shall be properly labeled and stored while on site. Bulk chemical storage for drums or other containers of hazardous or otherwise regulated liquids larger than 25 gallons requires secondary containment and grounding for flammables.
2. Contractor shall maintain on-site copies of Material Safety Data Sheets (MSDSs) for all hazardous material brought onto the site. These MSDSs must be kept readily accessible for employee use.
3. Chemical spills shall be reported to SRS.
4. Hazardous materials that could cause illness if released or not properly used shall be kept properly stored. If any report of serious illness on site is reported, the contractor shall shut down that particular operation until the situation is corrected.

01 40 00 Quality Requirements

01 41 00 Regulatory Requirements

01 41 13 Codes

Design criteria must include the use of NFPA standards. The standards include 12 volumes and 248 individual standards. Also, since New Mexico operates under different jurisdictional codes such as the ~~Uniform~~ International Fire and International Building Codes, the most stringent requirement will apply on all UNM projects.

01 41 16 Laws

All UNM buildings shall comply with the following:

NM Executive Order 2006-001, State of New Mexico Energy Efficient Green Building Standards for State Buildings
http://www.emnrd.state.nm.us/ECMD/documents/EO_2006_001.pdf

Executive Order 2007-053 State of New Mexico Increasing Energy Efficiency in State Government by 2015 and Statewide by 2012 and 2020
http://www.governor.state.nm.us/orders/2007/EO_2007_053.pdf

Also, note that UNM President Dr. David Schmidly has signed the "American College & University Presidents Climate Commitment," committing UNM to pursue WATER AND CARBON NEUTRALITY for the campus.
http://www.presidentsclimatecommitment.org

01 50 00 Temporary Facilities and Controls

Indicate construction work site limits, fencing, laydown yard, etc.

01 55 00 Vehicular Access and Parking

Ensure special requirements for work site entrances, handicap access, walkways to remain open, fire truck and emergency vehicle access etc., are noted and must be maintained at all times

01 55 20 Traffic Control

Indicate ~~that~~ if traffic flow or road access must be interrupted or roads closed, the contractor shall obtain approval not less than 10 days prior.

01 55 19 Temporary Parking Areas

Indicate contractor worker parking.

01 56 00 Temporary Barriers and Enclosures

1. The contractor will be responsible for preventing access to the building site to unauthorized persons. Pedestrians can create safety hazard issue as well as fire safety hazards. Barriers to prevent unauthorized pedestrian traffic will not cause obstructions to emergency vehicle access unless the emergency services are notified of a specified time when access will be impaired.
2. Do not obstruct existing streets, walkways, access corridors, etc. unless specific written permission is granted by owner.
3. The contractor must maintain pedestrian access to UNM facilities adjacent to the construction site whenever practical.

01 56 16 Temporary Dust Barriers

Do not generate airborne dust, which may contain asbestos- or lead-containing materials.

01 57 00 Temporary Controls

1. For projects disturbing more than one acre of soil or pavement, prior to breaking ground, the Contractor must make required EPA notifications, obtain an NPDES permit or waiver, and develop and comply with any required site-specific Storm Water Pollution Prevention Plan (SWPPP). SRS may request revision of contractor's SWPPP. UNM may be required to collect damages for Contractor non-compliance with the NPDES or SWPPP of up to $1000 per day per violation.
2. All projects disturbing more than 3/4 acre of soil or pavement must obtain a Fugitive Dust Permit from the City Air Quality Division (AQD) prior to breaking ground and must comply with the associated AQD-approved Dust Control Plan. Required dust controls must be maintained over project duration, including site watering, track-out prevention, street sweeping and covering all truck loads of soil to/from site. Any required erosion/dust controls must be regularly inspected & maintained over project duration.
3. The SWPPP and the Air Quality permit should use the Best Management Practices that work in conjunction with each other, i.e. watering, perimeter silt fencing etc. The Project Engineer should review and discuss the SWPPP and Air Quality permit with the contractor prior to submission of these applications.

DIVISION 02 – EXISTING CONDITIONS

Photographs and/or videotapes of existing conditions including adjacent structures shall be taken and submitted. Existing conditions before the start of work shall be documented.

02 01 00 Maintenance of Existing Conditions

1. Support and protect existing structures & utilities.
2. Promptly repair damages to adjacent structures and facilities if incurred.

02 20 00 Assessment

02 21 00 Surveys

Require that a professional surveyor document the existing conditions of adjacent structures prior to start of work. Establish benchmarks including elevations and maintain a project log to become part of the as-built records. Survey resurvey to verify no adverse project impact. Notify the Architect and UNM of changes in elevations, cracks, sags, or other damage in adjacent structures.

02 30 00 Subsurface Investigation

02 32 00 Geotechnical Investigations

1. Soils testing laboratory and other required specialty testing to be retained by owner.
2. Concrete testing laboratory to be retained by contractor. Do specifications indicate required testing: i.e. number of cylinders, maximum fill lifts, etc.

02 60 00 Contaminated Site Material Removal

Prior to start of work, verify that there are no hazardous materials at the site with UNM-SRS. If so, request direction as to what needs to be done to remove the hazard prior to start of work. Documents need to advise the contractor that if hazardous materials are found during the performance of work, stop work and contact UNM and the Architect for direction.

02 80 00 Facility Remediation

1. Ozone Depleting Substances (e.g., Freons & related refrigerants) - Refrigerants must be recovered by EPA-certified technicians prior to demolition of refrigeration & HVAC equipment.
2. Prior to demolition or removal, any equipment containing hazardous or otherwise regulated materials must have those materials abated removed.

3. If asbestos and/or lead-containing materials are known to be present in the work area as determined by the pre-construction survey, then asbestos and/or lead awareness training must be completed prior to any construction workers being sent assigned to work in such a work area, and appropriate PPE must be worn when required by work conditions.
4. Installation and/or application of lead-based paint and asbestos-containing materials during renovation are prohibited.

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

No black roofs are allowed

Any green (vegetated) roofs must be a manufacturer standard product and not custom-designed.

07 06 00 Schedules for Thermal and Moisture Protection

07 06 20 Schedules for Thermal Protection

1. Install insulation to match ASHRAE Standard 189P requirements.
2. Borosilicate urethane thermal coatings are approved for all installations and encouraged for retrofit situations.
3. Insulation is to be installed outside the mass of the buildings.

07 80 00 Fire and Smoke Protection

07 84 00 Firestopping

07 84 13 Penetration Firestopping

All penetrations through fire rated walls, floors, ceilings, barriers and partitions will be appropriately filled with approved "FIRE STOP" material. The material must carry an Underwriters Laboratory and Factory Mutual listing/approval for the application to be used. Documentation from the manufacturer must be provided to SRS and E&ES for review along with written affirmation that materials were installed in accordance with the manufacturer's requirements.
Pipe penetration will use sheet metal sleeves.

DIVISION 08 – OPENINGS

08 10 00 Doors and Frames

1. Visual panels in doors may be used when needed for safe travel through a high traffic area. The visual panel will be limited to a maximum of 12" x 12" and be installed by the door manufacturer. The panel and frame must be stamped as a fire rated unit equal to the rating for the door.
2. Roof access shall be by staircase. In the event that roof hatches are used in retrofit situations, OSHA-compliant access ladders shall be installed.

08 50 00 Windows

1. Window panels in fire rated walls must be stamped by the manufacturer, as meeting the fire rating requirements of the adjacent door wall. The stamp must be visible when installed. Windows or glass panels cut from a stamped panel will not be authorized.
2. In all cases where operable windows are desired, switches shall be incorporated to put the HVAC system for the space into "unoccupied" mode whenever the window is opened.

08 50 00 Roof Windows and Skylights

All skylights will incorporate skylight guards, handrails or other guarding mechanism that meets OSHA standards.

08 70 00 Hardware

08 71 00 Door Hardware

1. Self-closing devices will be installed on all fire rated doors. The devices will be manufactured and installed as an Under Writers Laboratory (UL) listed unit. Self-closing hinges, which meet the intent of NFPA 80, may be used with prior approval from SRS and or the AHJ.
2. Doorstop devices will not be installed on any fire rated door. If the user requires requests an open flow of traffic through the area with a fire rated door, normally required to be kept closed in an emergency, magnetic door hold open devices shall be incorporated and must be connected to the building fire alarm system, as required by NFPA 80 & 101. The magnetic devices must release when any part of the fire alarm/notification system is activated. All magnetic devices will incorporate smoke detection on both sides of the door.
3. All door hardware shall be in full conformance with the UNM PPD Lock Shop requirements & specifications.

DIVISION 09 – FINISHES

09 06 00 Schedules for Finishes

1. Chemical Emissions - Only "low-VOC" architectural coatings, adhesives & solvents can be specified and used. A written inventory of total coatings, adhesives & solvent volumes used and VOC contents must be submitted to SRS at the end of the project.
2. All interior finish materials shall comply with NFPA 101. Only Class A or B material will be used. Class C material is considered to have an unacceptable flame spread rating and will not be permitted in any UNM construction project. Documentation of flame-spread ratings will be made available and provided to SRS upon request. Requests may be made if a questionable material is noted during the specification review or during construction site visits.

DIVISION 10 – SPECIALTIES

10 50 00 Storage Specialties

Custodial Services Main Storage Room: This room is ideally located adjacent to the trash room and loading dock and shall be approximately 250 to 300 sq. ft. with a double door from the corridor. Room shall have a hot and cold water hose bibb and floor sink floor drain. The room shall have interior lighting and control switch and several 110 volt receptacles around the perimeter of the space. The room shall have not less than twelve linear feet of utility shelving, the top shelf being not higher than 5 feet

10 56 00 Storage Assemblies

A minimum of three (3) feet of aisle space is required between rack and stack storage.

DIVISION 11 – EQUIPMENT

11 10 00 Vehicle and Pedestrian Equipment

11 13 00 Loading Dock Equipment

Loading Dock: Loading docks require nearby access to a hot and cold water hose bibb. Loading dock requires a drain to a sanitary sewer.

11 50 00 Educational and Scientific Equipment

11 53 00 Laboratory Equipment

11 53 13 Laboratory Fume Hoods

1. All fume hoods shall be integrated into a variable air volume system for both supply and exhaust.
2. All fume hoods shall incorporate proximity sensors to move to low-flow condition when not in use.
3. All fume hoods shall incorporate a flow monitoring and warning device.

11 53 13.13 Recirculating Laboratory Fume Hoods
See section 11 53 53

11 53 53 Biological Safety Cabinets
Wherever possible with programmatic requirements, bio-safety cabinets shall be of the recirculating HEPA-filtered variety (e.g., Class II Type A2).

11 80 00 Collection and Disposal Equipment

Trash Rooms: ~~State Health~~ NM Environment Department regulations require an enclosed facility for trash. Trash must be protected from the elements and free of rodent and insect harborage. Minimum size is 120 sq.ft. Trash rooms shall have double doors from the outside loading area and double doors are preferred from the interior corridor into the trash room. Trash rooms shall have a dedicated 110 volt outlet in addition to other required power facilities. Trash rooms shall have sealed concrete floors, a floor drain connected to the sanitary sewer and hot and cold water hose bibb. Trash rooms shall have interior lighting and control switch. Trash rooms shall have adequate ventilation and be protected from freezing.

Recycling Rooms: Provide recycling areas on all floors in accordance with UNM's recycling program

DIVISION 12 – FURNISHINGS

12 90 00 Other Furnishings

12 93 00 Site Furnishings

12 93 13 Bicycle Racks

1. All buildings shall have bicycle racks in close proximity.
2. Bicycle racks shall be of the loop type, firmly anchored to concrete and in compliance with the requirements laid out for UNM Main Campus Standard Outdoor Furniture by the UNM Planning & Campus Development office.
3. Enclosed bicycle lockers should be installed where appropriate
4. Enclosed bicycle lockers shall be mounted on a hard surface with proper drainage to prevent condensation inside and rusting of contents.

DIVISION 14 – CONVEYING EQUIPMENT

14 20 00 Elevators

1. All elevator shafts will incorporate sprinkled shafts, smoke detection at each level outside the elevator, heat, smoke detection and sprinklers in the elevator room regardless if the elevator is electric or hydraulic. The elevator will also incorporate fire department recall for all elevators with a shaft over 25 feet in total length. Elevator lobbies must include smoke guards. A recall key will be provided in a location as determined by SRS.
2. Signage will consist of written visual signs noting Fire Dept. elevator operation and "IN CASE OF FIRE, USE NEAREST STAIRWAY DO NOT USE ELEVATOR". The signage will be posted in a conspicuous location. Signage will not be placed near or under bulletin boards or in other areas where hanging material will obscure the signage. All fire rated doors will have the appropriate signage (provided by the manufacturer) indicating its fire rating. This signage will be in the way of a metal placard, attached to the side of the door. The placard will not be covered/painted or otherwise obscured.
3. Consider providing a vestibule for any elevator that is exposed to the outside and or harsh environment.
4. Wherever possible, elevators shall be of the machine room-less gearless traction motor style (Kone EcoSpace variety or approved equal)

DIVISION 21 – FIRE SUPPRESSION

21 10 00 Water-Based Fire-Suppression Systems

21 11 00 Facility Fire-Suppression Water-Service Piping

All fire-suppression main mechanical connections at transitions between pipe materials (e.g., Mega-Lug fittings) shall be properly restrained.

~~21 12 00 Fire-Suppression Standpipes~~

Fire Department siamese connections (FDC) will be installed in a location, which will provide the quickest easiest access to fire department vehicles. The FDC must be placed so no more than 100 ft. of fire hose is required to make connection between the FDC and the fire engine.

FDC sizing.

A) When the total fire-suppression system demands, including inside hose allowance, is 750 gpm or less, the FDC riser shall be minimum four (4) inches in nominal diameter and have appropriate connections as required by code unless otherwise approved in writing by UNM PPD.

B) When the total fire-suppression system demands, including inside hose allowance, is 750 gpm or greater, the FDC riser shall be six (6) inches nominal diameter and have appropriate connections as required by code unless otherwise approved in writing by UNM PPD.

21 12 16 Fire-Suppression Hose Reels.

UNM has adopted a policy (which has been approved by the State Fire Marshal) of not installing class I or II fire hose cabinets in any UNM facility. Class III cabinets for fire department standpipe connections will be permitted. Fire hose cabinets will not be used as a means to waiver the requirement for sprinkler protection.

21 13 00 Fire-Suppression Sprinkler Systems

21 13 13 Wet-Pipe Sprinkler Systems

1. The minimum detection and protection requirements for storage, custodial and trash rooms will be smoke detection and wet pipe fire sprinkler systems connected to the fire alarm panel.
2. Fire sprinkler system drawings (contract drawings) shall indicate the service entry, the siamese connections, the supply manifold assembly with all alarms and switches, the vertical and horizontal distribution piping and

valves and supply piping to all protected areas. Indicate test drains piped to reasonable central locations. Drains can not simply be left to drain anywhere. Indicate head coverage as part of the specification with proper accounting for drop soffits, special conditions, etc. It is recommended that head locations, or at least head locations at special conditions be detailed. These drawings shall be submitted to CID for permit.

3. Fire sprinkler shop drawings shall be reviewed and approved by the design engineer. The drawings with professional fire protection engineer's seal shall also be transmitted to the State Fire Marshal's office for review in accordance with the State Fire Marshal's Plans Review and Submittal Requirements, the latest edition. Proof of submission is necessary so that work can commence. Due to staffing, the Fire Marshal may not be able to review the drawings on a timely basis and therefore, the Design engineer's review and approval will be sufficient to start work.
4. Verify good riser location and accessibility
5. All sprinkler systems will incorporate a backflow preventer.
6. All new construction will comply with NFPA 13 and the UBC requirement that all structures will incorporate full fire sprinkler systems. Sprinklers in conjunction with full smoke/heat detection or other suppression systems will be considered on an individual basis.
7. Pipe joints may be welded, threaded or Victaulic grooved-rigid couplings. No Plain End, Pressfit or FTT type couplings permitted
8. Standard pendent/upright wet sprinkler systems will be used in all facilities unless justified recommendations for alternative systems are presented.

21 20 00 Fire-Extinguishing Systems

1. Special system installation will be determined on the overall protection requirements of the facility and the specific requirements for the particular use of the area in the facility.
2. If high rack, closed rack or pile storage is to be designed, consideration will be given to the requirements of specialized suppression system design
3. Areas or rooms used for storage of flammables and fuels shall have appropriate fire suppression systems. Flammables shall be in original containers or safety cans, and stored in cabinets remote from traffic.
4. The standard type fire extinguisher to be specified in all projects shall be:
   - For business and all light/ordinary hazard areas: 2 1/2 gallon water extinguisher recommended.
   - For Mechanical rooms and rooms with flammable liquids: 10 lb. ABC Dry Chemical extinguisher recommended.
   - For elevator rooms: 10 lb. CO_2-ABC extinguisher
   - For computer rooms: 2A10BC Halotron (or equivalent)

- For Automotive and Industrial areas: 15-20 lb. ABC Dry Chemical
- For laboratories or other areas with high cost or sensitive equipment as determined by SRS: 2A10BC Halotron (or equivalent)
- For areas including laboratories which utilize flammable liquids as determined by SRS: 10-15 lb. ABC Dry Chemical

5. No extinguisher with less than a 2A-10BC rating will be accepted for UNM projects. Exception - CO_2, which does not carry an "A" rating and will be used only in specific coverage areas. The general area will still be covered by an extinguisher with a 2A-10BC rating.
6. The cabinet's style and features will be specified during plan reviews of each project. UNM does not specify a particular style, but each cabinet will have the following features
   - Be of a size which will accommodate a 2 1/2 gallon water extinguisher, a 15 lb. Halotron or a class C water mist extinguisher if necessary
   - Window port for visual inspection of the pressure gauge.
   - The outside of the cabinet will have, in clear contrasting color to the cabinet, the words FIRE EXTINGUISHER regardless of the type size of the visual panel
   - The door will be a straight pull-to-open type without a locking mechanism unless specified by SRS for a specific application

21 22 00 Clean-Agent Fire-Extinguishing Systems

FM 200 or similar alternative systems will be used in computer rooms requiring such protection. Alternative systems such as water mist will be considered on a case-by-case basis.

21 23 00 Wet-Chemical Fire-Extinguishing Systems

Only Wet Chemical hood systems will be installed in cooking facilities.

21 30 00 Fire Pumps

Fire pumps shall be used only as a last resort in accordance with the 2007 agreement between UNM and the NM State Fire Marshal.

DIVISION 22 – PLUMBING

1. Provide adequate building wall thickness to accommodate piping and fittings.
2. Provide adequate maintenance access.
3. Unless required by code (i.e. Food Service areas) or stated in the OPR as required for the location hot water shall not be distributed to the public restrooms.

22 06 00 Schedules for Plumbing

22 06 10 Schedules for Plumbing Piping and Pumps

22 06 10.13 Plumbing Pump Schedule

All pump motors over 1 hp shall be premium efficiency.

22 08 00 Commissioning of Plumbing

Pipe testing, flushing and treatment shall be specified

22 10 00 Plumbing Piping and Pumps

22 11 00 Facility Water Distribution

1. Isolation valves at each branch take-off for CW, DHW, DHW return
2. Isolation valves at each item of equipment which are separate from balancing and control valves.
3. Provide accessible isolation valves at major branch take-offs, each floor and in long runs of pipe.
4. Reasonable drain valves and caps
5. Velocity in hot and cold water lines shall not exceed 5 feet per second
6. Water lines shall not be routed over computer rooms or electrical rooms.
7. minimum pipe size shall be ½" for 1 fixture where the flow does not exceed 2.5 gpm and ¾" for 2 or more fixtures where the flow does not exceed 5 gpm.
8. Domestic hot water shall be supplied at 105 - 120F
9. Use only copper piping with soldered joints
10. gaskets made of natural rubber are prohibited
11. provide trap primers for all drains which do not see daily water flows
12. Provide separate non potable water line to soap dispensers in Area 2 janitor rooms
13. Do not place plumbing in or above IT rooms unless needed for direct support of systems in those rooms.

22 13 00 Facility Sanitary Sewerage

1. Areas or rooms used for storage of hazardous or otherwise regulated liquids larger than 5 gallons may not have floor drains
2. Specify minimum 4-band worm clamps on cast iron no-hub sanitary piping.

3. Sanitary sewage sump pumps shall only be used to convey waste generated below grade and only where gravity flow is impossible.
4. All sanitary waste generated above grade shall drain via gravity.
5. Pursuant to a 2008 agreement between UNM and NM CID, sanitary waste systems within laboratory buildings shall be constructed of Schedule 40 PVC or similar plastic material as appropriate for required fire/smoke ratings. Neutralizing tanks are not to be installed.
6. CPVC or polypropylene shall be used for connections to lab sinks and similar equipment with polypropylene for traps and trap arms. Verify that joining methods are compatible.
7. Do not place drains in or above IT rooms unless needed for direct support of systems in those rooms.
8. Do not locate restrooms above or adjacent to IT rooms.

22 14 00 Facility Storm Drainage

22 14 26 Facility Storm Drains

1. All facility drainage infrastructures shall be sized and routed in accordance with a drainage plan. The plan shall use the City of Albuquerque's DMP Section 22.2 method.
2. Areas where the storm drainage is inadequate must be upgraded at the projects cost to adequately convey the 100 year storm.
3. Storm drains shall be designed so that no sump pumps are needed.
4. Indicate an adequate water-harvesting plan consisting of swales, retention facilities, volume control, overflow considerations, etc. Roof drains should direct water into plantings or be used for other beneficial uses whenever possible before discharge to the storm disposal system.
5. Indicate foundation/flooring drainage if required.
6. No building entrances at bottom of grade unless such entrances are protected by an adequate swale.

22 14 26 13 Roof Drains

1. Indicate roof drain locations.
2. Indicate roof drain outfall locations.
3. All roof drain piping shall be cast iron. PVC roof drain piping is not allowed.
4. Roof drains shall not daylight on the north side of buildings.
5. All roof drains shall be insulated.
6. No more than 5000 SF of roof shall be served by a single drain.

22 30 00 Plumbing Equipment

22 35 00 Domestic Water Heat Exchangers

Approved steam heated DHW heater specified.

22 40 00 Plumbing Fixtures

22 42 00 Commercial Plumbing Fixtures

1. Specify electronic 120 volt hard-wired sensor activated toilet, urinal and lavatory fixtures. Restroom water faucets should be 0.5 gpm and turn off automatically after 4 seconds of non-use.
2. Urinals shall be ultra-low flow models. Specify Zurn 0.13gpf/0.5lpf models or equivalent.
3. Toilets shall be rated for 1.28 gallons per flush
4. Drinking Fountains are non-electric.

22 45 00 Emergency Plumbing Fixtures

Chemical storage areas shall have plumbed eyewash, deluge showers

22 45 13 Emergency Showers

Emergency Showers shall be located such that there is adequate drainage for 30 gpm from the space under the shower.

DIVISION 23 – HEATING, VENTILATING and AIR-CONDITIONING (HVAC)

1. Combustion Equipment - Provide SRS with manufacturer specifications, including air emission rates, at least 4 months before construction to allow time to obtain the required air quality permit prior to equipment installation.
2. The building architectural design shall provide adequate ceiling space and equipment room area for a well coordinated layout of ductwork, piping systems, electrical conduits, cable tray, special plumbing systems, etc. as necessary to provide accessible and maintainable components.
3. Areas or rooms used for chemical storage shall have appropriate ventilation.
4. Provide composite equipment room, mechanical room, etc. drawings, including all trades, to be sure all facilities fit and are accessible. Provide an overall plan with plumbing, HVAC, major electric boxes, etc. to ensure adequate space. Don't forget piping and racks.
5. Provide section cuts where necessary for clarity.
6. Provide building sections where space is limited and facilities are large, particularly above ceiling spaces, to be sure the items fit and are accessible. Indicate what work should go in what location to insure this.
7. Contractors' installation assembly coordination drawings are required.
8. All rooftop equipment to be located at least 10' from parapet or edge of building.
9. Guards shall be provided for all rotating equipment.
10. Working clearance for all equipment shall be shown on drawings and maintained.
11. Utility shutoffs shall be provided convenient to equipment.
12. Seismic bracing shall be provided for all equipment.
13. Provide valved high point vents and low point drains. Include ¾" hose bibs at drains.
14. Provide startup strainers for all equipment not equipped with individual strainers
15. All hydronic piping shall be flushed and passivated
16. Provide chemical water treatment for all closed loop hydronic systems

23 05 00 Common Work Results for HVAC

23 05 93 Motors

All motors over 1 hp shall be premium efficiency

23 05 93 Testing, Adjusting and Balancing for HVAC

Air balance system primarily by reducing fan speed. At least one balancing dampers shall be remain wide-open

All T&B contractors must be NEBB certified.

23 06 00 Schedules for HVAC

1. Selection of the building HVAC system must be made at the schematic design phase. The mechanical engineering design team must be actively involved in the project prior to submission of the schematic design drawings and specifications so that the HVAC system selected will fit and function within the architectural scheme.
2. Selection shall be based on the total owning and operating costs for the system over a thirty year period, operating five days per week, ten hours per day (or building specific requirements). The analysis shall include but not be limited to system first costs, additional first costs associated with the system that increases or decreases building construction costs, energy consumption costs, usual and customary maintenance and replacement costs and any other costs that affect total operating cost.
3. The system selected shall be as simple in configuration and design as possible, yet durable to satisfy the building needs. It shall emphasize ease of maintenance activities and flexibility to accommodate future renovation. Evaluation and justification of alternative system designs which use less energy is encouraged.
4. The design goal is to create a facility that meets LEED Silver requirements and complies with New Mexico Executive Order 2006-001.
5. New facilities shall be designed to help UNM move towards the goals laid out in the American College & University Presidents Climate Commitment of which UNM is a signatory.
6. The design shall comply with current ASHRAE Standards unless that conflicts with UNM design criteria or a specific waiver is approved by UNM.
7. Heating and cooling systems shall be sized for morning warm-up/cool-down to allow transition from unoccupied to occupied setpoints within 1 hour.

23 06 20 Schedules for HVAC Piping and Pumps

23 06 20.13 Hydronic Pump Schedule

All pump motors over 1 hp shall be premium efficiency.

23 06 30 Schedules for HVAC Air Distribution

23 06 30.13 HVAC Fan Schedule

All fan motors over 1 hp shall be premium efficiency.

23 08 00 Commissioning of HVAC

1. All new buildings' HVAC and control systems shall be commissioned either by UNM PPD's Energy Services group or by a third-party agent paid for by the project but hired and ~~controlled directly~~ directed by UNM PPD E&ES
2. After 10 months of operation, the design team and UNM shall meet to analyze utility consumption results and determine system modifications that may be necessary to achieve the goal
3. Commissioning & Warranty
   a. All sensors, actuators, and end devices including sequence of operation shall be commissioned by the contractor and a report provided to UNM
   b. Commissioning work shall use the UNM pre-functional and functional test reports unless alternates are approved by UNM prior to the work being performed
   c. Final commissioning shall be the responsibility of the installation contractor and subject to oversight and scheduled with UNM personnel. A completed commissioning report shall be submitted and included in the equipment manuals. ~~Each report~~ shall ~~include the results of each end device commissioned along with the initial point reading compared to actual, corrected point reading compared to actual and any offset used in calibration.~~ Test instruments used for calibration of sensors shall be calibrated prior to testing to insure their accuracy.
   d. Each new control system shall have provided a two-year manufacturer warranty for all components from date of UNM acceptance. A one-year service and maintenance warranty shall be provided from the date of UNM acceptance.
   e. Each new installation shall require a minimum of two on site training sessions provided by the equipment installer / provider. A UNM representative shall coordinate the training with the installer after final acceptance by UNM. The training shall include sequence of operation, override procedures, calibration procedures, workstation operation. Each session shall be no shorter than 2 hours and no longer than 4 hours. Class size shall be determined by UNM
   f. Upon completion of all documents and successful start-up and training of personnel a systems manual shall be prepared for each commissioned system including HVAC, lighting, domestic water and renewable energy systems. As a minimum the manual will contain piping and instrument diagrams, control diagrams, graphics, Operational and Maintenance Manuals for all equipment and instruments, spare parts, contacts with address and phone number for equipment and instrument vendors and all commissioning reports. The report will be tabbed for easy access.

23 09 00 Instrumentation and Control for HVAC

1. Direct Digital Controls shall be employed
2. HVAC systems shall interface with campus EMCS (Energy Management and Control System)

3. Variable volume laboratory designs shall be used.
4. Heating water pumps shall be equipped with VFDs
5. Heating water temperature shall be reset based upon OA temperature
6. Discharge air temperature shall be reset based upon reheat demand
7. Minimum OA (Outside Air) intake reset shall be based upon ASHRAE 62.1.
8. An unoccupied/occupied building schedule shall be provided
9. Building occupancy and temperature over-ride shall be provided at room temperature sensor
10. Provide utility metering of chilled water, steam, domestic water, natural gas in accordance with PPD-Utilities Metering Guidelines
11. Thermostat locations shall be specified to ensure even temperature distribution in the conditioned space.
12. Thermostat setpoints shall be established in accordance with UNM Energy Management Policy 5100.

23 09 13 Instrumentation and Control Devices for HVAC

All points included in the HVAC system shall be labeled in accordance with the UNM Point Naming Convention.

This applies to all components of the HVAC system that are integrated with the control system including but not limited to air handlers, heat exchangers, fans, terminal units, dampers, thermostats, pumps and valves

This naming convention shall be reflected in all drawings, control sequences, programming, graphics and field labels.

23 09 13.13 Sensors & Transmitters

All water temperature sensors shall be installed in wells.

23 09 13.43 Control Dampers

Measure CO_2 in air returning from spaces to each fan system, and adjust minimum outside air volume accordingly. In the occupied zones where occupant density is routinely greater than one person /30sf provide space return air CO_2 sensor to ensure air quality control.

23 09 23 Direct-Digital Control System for HVAC

A UNM approved building DDC system is required. This system shall seamlessly interface with the campus EMS via BacNet TCP/IP protocol. Approved systems include Delta and Automated Logic for central and north

campus projects. Other systems may be considered with prior approval from PPD Engineering & Energy Services for projects in other locations.

DDC Controls Systems Specifications

1. General Logic Requirements
   a. P, PI, or PID completely selectable for each control loop
   b. Floating control output available for VFD control
   c. There shall be a proofing function for all DO points to alarm if action does not take place.
   d. All alarm levels to be set by UNM.
2. Air Side Requirements
   a. Discharge air temperatures reset on space demand
   b. OA reset based on CO2 levels.
   c. Unoccupied schedules at the zone or terminal unit level.
   d. Zone occupied overrides completely adjustable
   e. All air handler controllers shall be the primary controller.
3. Water Side Requirements
   a. Heating water temperature shall reset upon OA or space demand.
   b. Heating water pumps shall be equipped with VFDs.
4. Exhaust Requirements
   a. Variable volume laboratory system & hoods
5. DDC Hardware
   a. All exposed control wiring shall be in no less than ¾" conduit with compression type connectors. All flexible conduit shall be of the weatherproof type, no less than ¾" diameter and not longer than 5' in length and fittings of the same manufacture shall be used. All junction boxes within air handler plenums shall be weatherproof. All electrical local and state codes shall be enforced.
   b. All CAT-5 cable runs not to exceed 300'.
   c. All transducers or converters, D/A, A/D, electronic to pneumatic shall be mounted in the DDC control cabinet with the primary controller. When connecting DDC to existing pneumatic end devices a separate transducer is required for each AO control signal. A separate panel mounted adjacent to the primary control cabinet if more space is required is acceptable.
   d. All converters, transducers, sensors, wire terminations and end devices shall be labeled according to UNM labeling standards for ease of troubleshooting. A point list and wiring table shall be installed on the inside door of each control cabinet.
   e. All relays used shall have a lighted indicator as to when they are energized.
   f. All control cabinets shall be labeled on the outside as to what equipment they control.
   g. Under no circumstances shall any control cabinets contain voltages in excess of 50 volts and all control circuitry shall use voltages under 50

volts. Separate transformer or power supply enclosures shall be provided as required OR when located inside the control box the 120v terminals shall be shielded.

h.

i. All DDC valves and damper motor operators shall be spring loaded and on a loss of power shall fail to the following positions:

Outside air fail closed
Return air fail open
Relief fail closed
Heating water fail open, or to coil on 3-way valves
Chilled water fail open, or to coil on 3-way valves
Steam preheat fail open
All steam converter or generator valves fail closed

j. 110 volt AC outlet shall be installed outside and near each control cabinets and a service switch shall be mounted inside the cabinet

k. A desktop or laptop computer point of entry and security key shall be provided for each new building system installed.

l. Capability of change of program, add sensors, and tune system shall be made available to UNM

m. One view screen per mechanical room shall be provided to access all controllers within a building network.

n. All network system wiring shall have installed manufacturer specified ~~lightning~~ surge protection located in the network as recommended by the manufacturer

6. Communications & Graphics

a. Direct Digital Control, BACnet communication integration shall be compatible to interface with UNM campus EMCS. All necessary equipment for functional integration shall be provided

b. All graphics shall be linked to allow easy mobility from page to page

c. Each DDC building system controller will be completely stand-alone and all settings and trend data contained within a building computer with complete access by UNM maintenance personnel. The system shall not rely on a computer outside the building envelope to contain a database for it operation.

d. The building controls shall have full interface with laboratory control systems.

e. The DDC systems shall be integrated with lighting occupancy sensors so that unoccupied areas go into unoccupied mode

f. The DDC systems shall be integrated with operable windows such that when the windows are opened, the area goes into unoccupied mode.

g. All PTAC, RTUs and stand-alone HVAC equipment shall be compatible with and integrated with the DDC systems. With the exception of refrigeration and gas safeties, all control and monitoring points shall be fully ported to the DDC system

h. The minimum graphics requirements shall include:

i. Building summary page
ii. Floor plan for each floor with animation for each room's controls
iii. Complete graphics for each terminal unit
iv. Complete graphics for each air handler
v. Complete graphics for Hydronic systems
vi. Complete graphics showing lab control systems

i. Provide logic & troubleshooting graphics (DDC pages)
j. Two (2) data ports shall be provided for interface between the campus network and the DDC server. These are to be in the location specified by UNM PPD and will typically be located in a mechanical space or the building maintenance office. Note that there is a 300' limit on cabling runs from an ITS closet to this location.
k. Static IP address(es) shall be provided for interface between the campus network and the DDC server.
   i. One (1) is required for Delta systems.
   ii. Two (2) are required for Automated Logic systems.
l. The MAC address and physical location for each IP address shall be provided to UNM PPD Engineering & Energy Services

- Documentation
  a. All sequence of operation submittals shall be in tile logic and verbal format with a [illegible] or, start, alarm, etc. All digital signals drawn with a solid line, all analog signals with a dotted line. All submittals sizes shall not exceed 11 x 17 and shall become the property of UNM
  b. All points of entry shall be defined on a system architecture logic diagram.
  c. All files and data created in the DDC installation shall be the property of UNM.
  d. If system uses function blocks, documentation of function block operation shall be provided
  e. Six copies of all equipment manuals for controllers, end devices, sensors, and sequence of operation diagrams shall be provided to UNM at the end of each system installation, after the commissioning completion and acceptance by UNM. Each manual shall be in a standard size three ring binder labeled on the front cover and edge. Electronic file versions (CD) shall also accompany each copy submitted.

23 10 00 Facility Fuel Systems

23 11 00 Facility Fuel Piping

23 11 23 Facility Natural-Gas Piping

1. Provide a shut-off valve at each connected item of equipment
2. Consideration should be given to installation of a master emergency gas shut off valve to specific areas such as laboratories, classrooms and other similar spaces that can be accessed by the occupants in an emergency. The valve

would be in a conspicuous location and be in a break-glass box to provide security from malicious actions.

3. All gas piping must be labeled as to the contents of the piping.
4. Gas piping shall not be run through HVAC duct work or have pressure relief valves, inspection ports or any other part of the system which could produce a leak near any air intake or ventilation vent/port.
5. Unless required by the OPR, gas piping shall not be run inside buildings where the gas pressure exceeds 2 psi

Underground gas piping must have a brass cap, on the surface, over the line indicating the direction of the line. A brass cap is required at every tee and elbow.

23 20 00 HVAC Piping and Pumps

23 21 00 Hydronic Piping and Pumps

1. Process cooling shall be provided as necessary through the use of plate & frame heat exchanger interface with the campus chilled water system. Pumps are only required on the process side of the heat exchanger. Return water to the campus system shall be no less than 58°F
2. Backflow preventers shall be installed to isolate all hydronic systems from domestic water supplies.

23 21 13.23 Aboveground Hydronic Piping

1. Utility meter location with dimensioned straight pipe upstream and downstream
2. Isolation valves on each branch take-off
3. Isolation valves at each item of equipment, coil, reheat VAV box, etc. which are separate from balancing and control valves.
4. Drains at low points
5. Vents at piping high points and at equipment
6. Pipe reheat and air handling coils rigid unless unit is supported by springs
7. Where used (primarily at pumps), use braided flexible stainless steel connectors (no rubber connectors)
8. Reverse return heating system piping
9. Reverse return coil bank piping
10. Piping shall be copper or steel. Victaulic couplings are not allowed
11. Metal insulation jackets in exposed areas
12. Place-up insulation or pre-formed plastic jacketing around all hot piping appurtenances such as steam pressure reducing valves, check valves, flanges, valves, etc.
13. Hydronic piping shall not be installed in or above IT rooms.

23 21 23 Hydronic Pumps

Dual heating water pumps shall be provided at 100% capacity each and shall be provided with VFDs.

Pumps equipped with VFDs shall be selected with full-size impellers.

Chilled water pumps are not to be used within buildings that are connected to the campus chilled water system.

23 25 00 HVAC Water Treatment

1. Specify pipe testing, flushing and treatment.
2. Equipment must be included to allow addition of water treatment chemicals to all hydronic systems

23 27 13 Motors

All motors over 1 hp shall be premium efficiency.

23 36 00 HVAC Air Distribution

1. Base system design for typical variable air systems for classroom spaces, administrative spaces, and common spaces shall be single duct VAV system with hot water re-heat coils in terminal units. Electric reheat is not allowed
2. Alternative systems shall be studied where constant volume airflow is required such as in laboratory spaces. Economic evaluation shall be made of constant volume reheat and dual duct constant volume with separate fans on each deck
3. Return air duct/path design shall insure that the free open area required is not restricted. Return air design velocity through ceiling grilles shall not exceed 300 fpm of free open area. Return air design velocity through wall transfer openings shall not exceed 450 fpm of free open area
4. All exhaust ducts shall be under negative pressure inside buildings
5. Design velocity for general exhaust ducts shall not exceed 1500 fpm except as required for special systems. Special exhaust systems shall be designed in accordance with Industrial Ventilation guidelines.
6. Variable flow systems with variable frequency drives shall be used wherever possible.

23 31 00 HVAC Ducts and Casings

1. The maximum velocity for medium pressure supply duct shall not exceed 2500 fpm

2. The maximum pressure drop for low pressure supply duct shall not exceed 0.07"w.c./100 ft.
3. shall be AHSRAE 90.1 leakage class 3/SMACNA Seal Class C.
4. Ductwork shall not be installed in or above IT rooms unless specifically supplying equipment within those rooms.

23 31 13 Metal Ducts

No spin-in duct take-offs. Use conical or 45° flare fitting

23 32 00 Air Plenums and Chases

1. Vertical duct shafts shall be accessible from each floor, and be provided with enough extra space, perhaps 20% to 25%, to accommodate the installation of future ductwork, pipes, conduits, etc. within the shaft construction
2. Return air paths and grille sizes adequate from spaces to air handling units

23 33 00 Air Duct Accessories

23 33 33 Dampers

23 33 13.16 Fire Dampers

Fire/Smoke Dampers (FSD)

1) FSDs will be operated by a duct type smoke detector/tube device. Fusible links will NOT be acceptable for any UNM project
2) All FSDs will be tied into the building fire alarm system as addressable nodes.
3) ~~Smoke-fire damper between different occupancies~~
4) Ducts entering or leaving electrical & IT equipment rooms will require a FSD.
5) All FSD will incorporate access doors for inspection. The access doors will:
   a) be of fire rated construction when penetrating a fire rated wall
   b) be rated for smoke seal when penetrating a fire smoke rated wall.
   c) have ceiling access doors measuring a minimum of 24"x 24" for inspection access
   d) be labeled "fire smoke damper" on the outside of the access door and or the access tile or ceiling area as appropriate and determined by SRS.
   e) incorporate smoke detection activation on both sides of the damper.
   f) duct access panels which are tightly sealed with a mechanical latching mechanism

23 33 46 Flexible Ducts

1. Flexible ductwork shall be limited to 90° of bends and a length of 6 feet
2. Use rigid ductwork elbow at diffusers
3. No flexible ductwork on high pressure side of terminal box

23 33 53 Duct Liners

No internal acoustical duct lining shall be used in any supply air system.

23 34 00 HVAC Fans

1. Fan speed shall be much less than 1750 rpm
2. ~~Supply fan~~ Air Handler external static pressure less than 3"w.c. for units with return air and less than 2"w.c. for 100% outside air systems.
3. Exhaust fan static pressure shall be adequate for hood and fan discharge requirements
4. Fans shall be selected for the best possible performance and lowest cost as measured by 10-year net present cost considering unit size, unit cost and energy performance.
5. Fans shall be selected to minimize noise. A room coefficient value of 35 shall be the design maximum unless specified by the OPR

23 36 00 Air Terminal Units

1. Balancing damper at branch take-off on low pressure side of terminal box
2. Ensure proper access to terminal boxes
3. Ensure that electrical, computer & telecom rooms have proper ventilation and cooling.
4. Zoning of terminal units shall be laid out such that interior and exterior zones are supplied separately.

23 36 16 Variable-Air-Volume Units

1. Three duct diameters straight length of rigid ductwork shall be installed on the supply to VAV boxes
2. Appropriate VAV minimum airflow settings shall be provided to minimize energy consumption.

23 38 00 Ventilation Hoods

1. No return air from laboratory spaces
2. No positive exhaust ductwork inside building
3. Avoid filters in exhaust ductwork
4. Fume exhaust fan upblast discharge velocity 3,000 fpm
5. Exhaust fans shall be selected to minimize noise and energy consumption. It is expected that all exhaust fans, even those on the UNM campus and away from neighboring properties will meet the requirements of the Albuquerque noise ordinance.

23 52 00 Heating Boilers

23 52 16 Condensing Boilers

Condensing boilers shall be specified wherever boilers are required. Ensure that HW supply and return temperatures are selected for the best overall performance with boiler, pump, coils and fans all taken into account.

23 57 00 Heat Exchangers for HVAC

23 57 16 Steam-to-Water Heat Exchangers

1. All steam-to-water heat exchangers shall be of the tube-and-shell steam converter type.
2. Control of converters shall be reset-able through the DDC system and each converter shall be supplied with 1/3rd and 2/3rd DDC control valves on the steam supply.
3. Steam PRVs shall be of a 1/3rd and 2/3rd arrangement.
4. Each converter shall be supplied with a vacuum breaker on the steam lines downstream of the control valves.
5. Pressure relief valve discharge piping shall be routed to ensure the protection of personnel in the mechanical room (e.g., no discharge to a sump in a small mechanical room).

23 70 00 Central HVAC Equipment

1. O.A. (Outside Air) intakes shall be located so they are not ~~in close proximity to~~ within 40' of streets, loading dock, exhausts, etc.
2. O.A. duct shall be long enough to pre-heat outside air to assist in avoiding freezing temperatures being introduced over coils and shall incorporate at least 2 elbows.
3. If CO2 sensors are not used within occupied areas then O.A. quantity shall be measured with a device accurate at the minimum O.A. flow.
4. Lights shall be provided inside all large AHUs.
5. Access panels shall be provided for all AHU sections.
6. Sound elbows shall be provided at all open DX unit return air intakes.

23 72 00 Air-to-Air Energy Recovery Equipment

Heat recovery systems may only be considered for systems requiring considerable amounts of outside air and when economically justified. Energy balance calculations shall be provided as part of the justification. Note that run-around coils often use more fan energy than the heat that is recovered.

23 73 00 Indoor Central-Station Air-Handling Units

1. Air Handling Units (AHUs) must be enclosed in an equipment room with enough clearance to allow for coil removal. Roof top units are not allowed.
2. Air handling unit chilled water coils shall be selected for 55°F discharge air temperature at airflow ~~of of no more than 450 fpm~~ velocities which minimize moisture carryover. Coils shall be selected at 20°F water temperature rise.

This temperature rise will help ensure the campus chilled water return temperature is at least 16°F above the supply temperature.

3. Cooling coils shall use 2-way valves selected with a differential pressure shut-off rating of 50 psig minimum.
4. Chilled water coils shall be 6 rows maximum. If conditions require greater coil capacity, two coils in series shall be used to achieve required duty, and shall be placed a minimum of 18 inches apart (with access between) to allow coil cleaning.
5. AHUs shall be selected to require no more than 20 bhp per 10,000 CFM inclusive of both return and supply fans. This power requirement shall be at mid-life filter pressure drops.
6. AHUs shall be selected to not require sound attenuators.

23 76 00 Evaporative Air-Cooling Equipment:

Evaporative cooling can be considered for use only for spaces requiring considerable amounts of outside air (e.g. laboratory system applications) upon UNM approval.

23 80 00 Decentralized HVAC Equipment

23 81 00 Decentralized Unitary HVAC Equipment

23 81 23 Computer-Room-Air-Conditioners

1. Computer rooms, electrical rooms, telecom rooms and similar spaces (e.g., ITS rooms) shall be properly conditioned. Refer to the "Vantage" ITS master plan for guidelines.
2. All ITS rooms with the exception of small Telecom closets shall be equipped with humidifiers to maintain a minimum of 30% relative humidity in the space.
   a. The upper limit is 50% relative humidity. In the NM climate, dehumidification beyond the amount already obtained from a DX or CHW cooling coil is not necessary unless the room is in a building that is evaporatively cooled. In those cases, supplemental dehumidification shall be provided.
   b. Water quality (hardness, conductivity, etc.) supplied to the humidifier shall be in full accordance with the humidifier manufacturer's requirements.
   c. Humidifiers shall be placed outside of the ITS room (with the exception of dedicated CRAC per section 4 below).
   d. Humidifiers shall be selected to minimize maintenance requirements and total cost of ownership.
   e. Humidifiers shall be located where they can be easily accessed for maintenance.

3. ITS rooms shall be equipped with standalone dedicated cooling systems that are independent of the central air handler(s). Such systems shall provide continuous service.
   a. In all cases, an in-room thermostat shall be used to control the system and the system shall be integrated with the building DDC system if such a system is present.
   b. If there is no DDC system in the building, the ITS room shall be controlled by a local programmable controls.
   c. ~~For buildings connected to campus CHW, a CHW fan coil unit shall be used.~~
      i. ~~The fan coil must be located outside of the space, either in a separate enclosure or above the ceiling in an adjacent space.~~
      ii. ~~Supply and return ductwork shall be provided from the fan coil to the room. Fire/smoke dampers shall be provided on both the supply and return ductwork to maintain the integrity of the ITS room's rated firewall.~~
      iii. ~~Supply air shall be distributed within the ITS room to the back of the telecom equipment racks.~~
      iv. ~~UNM PPD Engineering and UNM ITS must both approve the layout at each stage of design.~~
      v. ~~Monitoring & alarm with a shutdown interface shall be provided to avoid saturation of the space in the event of a coil leak or failure. It is recommended that this be accomplished via a duct humidistat with user adjustable setpoint.~~
      vi. ~~Gravity drained drip & condensate pans shall be provided.~~
      vii. ~~A makeup duct from the main HVAC system shall be provided to allow for room pressurization.~~
   d. ~~For buildings not connected to campus CHW, a~~ A DX split system shall be installed.
      i. These systems shall be variable load to run reliably and efficiently at all load levels from 20% to 100% of the ITS room's full-build-out capacity.
      ii. These systems shall be the most efficient units available.
      iii. If the ITS room is small enough that ductless units are used, they shall be mounted immediately below the ceiling.
      iv. If ducted units are to be used, supply air shall be distributed within the ITS room to the back of the telecom equipment racks.
      v. UNM PPD Engineering and UNM ITS must both approve the layout at each stage of design.
      vi. Gravity-drained drip & condensate pans shall be provided.
      vii. A makeup duct from the main HVAC system shall be provided to allow for room pressurization.
4. Large server rooms shall be equipped with standalone dedicated cooling systems that are independent of the central air handler(s).

a. Floor-mount Liebert units (or equivalent) shall be provided.
b. Where CHW is available, a CHW coil shall be used as the primary cooling, with a DX coil for emergency backup.
c. UNM PPD Engineering and UNM ITS must both approve the layout at each stage of design.
d. Supply air shall be distributed within the ITS room to the equipment racks and a cold/hot aisle concept shall be used.
e. Monitoring & alarms with a shutdown interface shall be provided to avoid saturation of the space in the event of a coil leak or failure. It is recommended that this be accomplished via a duct humidistat with user adjustable setpoint.
f. Gravity-drained drip & condensate pans/berms shall be provided.
g. All piping must be routed to minimize exposure within the server room and must be entirely within the berm drip pan.
h. An in-room thermostat shall be used to control the system and the system shall be integrated with the building DDC system.
i. A makeup duct from the main HVAC system shall be provided to allow for room pressurization.

5. In no case shall humidifiers or stand-alone air conditioning equipment be installed above IT equipment.

23 81 26 Split-System-Air-Conditioners

Provide hail guards for condensers

23 84 00 Humidity Control Equipment

23 84 13 Humidifiers

1. Avoid the use of humidifiers except where essential for programming requirements.
2. Straight length of stainless steel ductwork shall be provided at humidifier locatio
3. Humidifiers shall incorporate airflow sensing instruments to shutoff the unit in the case airflow loss or reduction below 80% of design.

DIVISION 26 – ELECTRICAL

. . Electrical closets and rooms will be constructed of at least a one-hour fire barrier, regardless of the construction requirements of the rest of the building. The closet door will be solid core (or fire rated metal) and be labeled for at least 20 minutes unless a higher requirement is called for by Code, with a self-closing device. Doorstops will not be installed on the door. NOTE- magnetic hold open devices *may be installed per NFPA 101 and 80 and connected to the fire alarm system.*

2. Remove completely all abandoned or unused electrical equipment and wire/cable.
3. Load summary schedule shall be provided.
4. Main equipment shall be properly sized to take into account planned future additions..

26 05 00 Common Work results for Electrical

1. Comply with UNM PPD E&ES "Electrical Specifications for Contractors and Personnel Doing Work at the University of New Mexico (latest edition)
2. Comply with the New Mexico Night Sky Protection Act
3. Comply with UNM PPD Utility's "Electrical Upgrade Guidelines."

26 05 19 Low-Voltage Electrical Power Conductors and Cable

1. All conductors shall be copper. Aluminum conductors are not permitted at UNM.
2. Metal-clad and non-metallic cables (including types: MI,AC,NM,MC,NMC,SNM,SE,USE,UF, or BX) should NOT be used on UNM property without the expressed consent of the Physical Plant Department Engineering and Energy Services Division (PPD-E&ES).
3. PVC pipe shall not be used above grade except in special applications that *have been pre-approved or are required for a special installation.*
4. All EMT fittings shall be of the compression type (gland & ring). Set-screw fittings will NOT be acceptable
5. The ends of all conduits containing wires of any type shall be bushed.
6. Conductor splices/taps in gutters shall be made using "*Polaris*" type connectors. Taped split-bolt connections are not acceptable.
7. All bolted pressure connections shall be torqued to manufacturer specifications
8. In general and where practical, all conductors should be continuous (no splices) from their point of origin to their point of termination. In NO case shall "Service Conductors" be spliced.

26 05 26 Grounding and Bonding for Electrical Systems

Grounding requirements shall be clearly defined and conductor sizes specified.

~~Load summary schedule shall be provided~~

~~Main equipment shall be properly sized.~~

Grounding and bonding requirements for IT equipment shall be verified with the UNM ITS Design Guidelines

26 05 29 Hangers and Supports for Electrical Systems

All conduit should be run parallel and perpendicular to the structure. No unsuitable angles, bends or suspended conduit will be allowed. Exposed conduit shall be run parallel and perpendicular to the structure and generally tight to structure

26 05 33 Raceway and Boxes for Electrical Systems

Under no circumstances will non metallic "Wiremold" (surface raceway) contain any conductors which carry more that 50 volts. In all cases where "self-adhesive" surface raceway is used, in addition to the raceway adhesive, at least 2 mechanical fasteners per ten foot length shall also be used (straps, screws, etc.).

26 05 53 Identification for Electrical Systems

1. Labels ~~will~~ shall be installed on all panels, disconnects, hardwired equipment, etc., identifying its use and where it is fed from. Labels ~~will~~ shall be installed on all switches and receptacles, identifying its circuit. Arc flash hazard labels shall be provided on all major electrical equipment.
2. The phasing of all conductors #8 and larger shall be identified by color coding tape. Conductors sizes #10 and smaller shall have colored insulation. The grounded (neutral) conductor sizes #6 and smaller shall be white or light gray, or have 3 continuous white stripes on other than green insulation. Grounded (neutral) conductors larger than size #6 shall be color coded white with coding tape. Grounding conductors sizes #6 and smaller shall have green insulation or be bare the entire length. Grounding conductors larger that size #6 shall be color coded green with coding tape. (Ref. NEC # 210.4, 200.6, 250.119.)

26 05 73 Overcurrent Protective Device Coordination Study

1. Indicate short circuit calculation values on drawings.
2. Equipment AIC ratings shall be appropriate ~~for the AIC~~ ratings for the calculated available fault values. ~~shall be appropriate for the total~~ equipment.
3. Arc flash incident energy calculations shall done, and printed labels for the major electrical equipment included in the study/report.
4. Short circuit, coordination and arc flash incident energy studies shall be done by either Emerson Electrical Reliability Services (ERS) or GE Engineering Services (GE) as a subcontractor to the electrical contractor. No exceptions.

26 06 00 Schedules for Electrical

26 06 20 Schedules for Low-Voltage Electrical Distribution

1. All switchboards, panels, Motor Control Centers (MCC's), etc. shall be shown on the appropriate plans and on the riser diagram.
2. Equipment designations shall be coordinated on the various plans and make logical sense ~~sensible~~. ~~These designations carry through~~ and ~~become panel labels.~~
3. HVAC equipment locations and designations on electric drawings shall match those on the Mechanical Drawings.
4. The following shall be specified at least once but not twice (mech & elect sections): electrical disconnects, equipment starters, VFDs, etc.
5. Power feeder/branch circuit sizing (conductor size and overcurrent protection devices) shall be coordinated with MECH equipment schedules.
6. Power shall be provided to sensor-activated lavatories, urinals, and toilets.
7. Power circuits shall be shown for elevator cab fan and lights and power shown for elevators.
8. Verify requirements for IT power in the UNM ITS Design Guidelines.

26 06 50

26 06 50.13 Lighting Panelboard Schedule

1. All lighting circuits shall be supplied via dedicated panels.
2. Where appropriate, lighting panels shall be of the GE Smartbreaker or Square-D PowerLogic type and shall be provided with Internet hookup to allow remote programming from the DDC Command Center.

26 08 00 Commissioning of Electrical Systems

1. Include an itemized description of equipment to be inspected and tested (describe required test(s), setting of OCPDs, etc. and reports required):
   a. Pad-mount switches
   b. Pad-mount transformers
   c. Medium voltage cables
   d. Dry-type transformers
   e. Low-voltage feeders (to panels, etc.)
   f. Circuit breakers, low-voltage, 225AF and larger
   g. Grounding systems
   h. Switchboards
2. Testing shall be done by either Emerson Electrical Reliability Services (ERS) or Electric Power Systems (EPS) as a subcontractor to the electrical contractor. No exceptions.
3. Resolve early on in the project what electrical equipment and/or systems should receive Enhanced Commissioning.
   a. Lighting Controls
   b. Photovoltaic System
   c. Life Safety Systems
   d. Etc.

26 09 20 Instrumentation and Control for Electrical Systems

26 09 23 Lighting Control Devices

1. Dual switching and switching of small areas to reduce energy usage shall be considered
2. Occupancy sensors shall be used to control lighting in appropriate rooms. Room lighting shall be controlled by motion sensors and should turn off 5 minutes after the last occupant leaves. Occupancy sensors shall not be used in electrical, mechanical or IT rooms/closets.

26 20 00 Low-Voltage Electrical Distribution

1. Provide NMEC/NEC required working clearances for switchboards, panels, etc. in inadequately sized electrical rooms.
2. Switchboard, panel and MCC physical sizes shall be shown correctly.
3. Switchboards, panels and MCCs shall be shown in appropriate locations
4. Provide an all inclusive plan that shows all equipment to ensure access.

26 22 00 Low-Voltage Transformers

26 22 13 Low-Voltage Distribution Transformers

1. Transformer secondary disconnects shall be provided in NEC required locations
2. Windings shall be copper
3. Belleville washers (in lieu of lock washers) shall be provided for all bus connections.
4. All connections must be properly torqued, using a calibrated torque wrench in accordance with manufacturer's recommended values.

26 24 00 Switchboards and Panelboards

1. ~~Panel~~ Main breakers shall be provided in appropriate locations and NEC required locations.
2. Panels and switchboards ~~All panel installed at UNM~~:
   a) Will be "Bolt-in" circuit breaker type
   b) Will have copper busses
   c) Will be provided with neutral and equipment ground lugs (bars).
   d) Will have a permanent label affixed to the ~~panel~~ front cover, showing the ~~panel~~ designation, ~~panel~~ voltage, and where it is fed from
   e) Will have an arc flash hazard label affixed to the inside of the panel cover.

f) Will provide 3 ~~0%~~ unused (spare) capacity for future use.

g) NEMA 1 panels will be "Door in Door" construction.

h) Any recessed panel installed, in addition to the circuits for which it is being installed, will have 4 (ea) spare conduits (minimum ¾" trade size) stubbed from the panel into ceiling space above for future.

i) Bonding (grounding) bushings will be provided on all ~~new panel~~ feeders.

j) The "AIC" rating of all panels/switchboards and associated overcurrent protective devices ~~circuit breakers should be approved by PPD E&ES prior to installation~~ shall be adequate to meet short circuit calculated values.

k) Panel/switchboard schedules and labeling must be completed (updated) ~~and protected from dirt by a plastic sleeve on the inside cover of the panel~~. This applies to both new and modified existing panels/switchboards.

l) All electrical equipment: panels, disconnects, etc. must meet the code clearance requirements.

3. No conductors shall be spliced within panel boards. Under no circumstances will "wire nuts" be accepted within any panel board. Conductors may not be installed within any panel or device raceway unless those conductors terminate within that specific panel or device.
4. At no time will a contractor leave any electrical switchgear, panels, or energized devices open or exposed in a public area without having qualified electrical personnel working on or guarding the exposed electrical components.
5. All panels shall have door-in-door fronts.
6. All panels/switchboards shall have copper busses.
7. All panels/switchboards shall utilize bolt-on circuit breaker devices in lieu of fuses.
8. Belleville washers (in lieu of lock washers) shall be provided for all bus connections in switchgear, busduct or standalone (e.g., ground bar).
9. All connections must be properly torqued, using a calibrated torque wrench in accordance with manufacturer's recommended values.
10. A TVSS shall be provided at the main electrical service panel/switchboard.

26 24 19 Motor-Control Centers

1. Motor-operated equipment (i.e. fan coil units) must be supplied by a minimum of a local manual motor starter with thermal overloads. It should be mounted on the side of the control enclosure, or within 3 feet maximum of the unit.
2. MCCs shall utilize motor circuit protectors in lieu of fused switches.
3. Bussing shall be copper.
4. Belleville washers (in lieu of lock washers) shall be provided for all bus connections.

5. All connections must be properly torqued, using a calibrated torque wrench in accordance with manufacturer's recommended values.

26 27 00 Low-Voltage Distribution Equipment

26 27 19 Multi-Outlet Assemblies

Standard tumbler switches and duplex receptacles shall be commercial specification grade, 20 amp. All terminations must be made using the screw terminals, not the "stab-in" provisions. Receptacles in restrooms, in kitchens, in labs ~~labels~~, on building exteriors, or within six feet of any water source shall be of the GFCI type.

26 28 00 Low-Voltage Circuit Protective Devices

1. Surge protection devices shall be provided in appropriate locations.
2. Shunt trip requirements shall be provided where required.

26 28 16 Enclosed Switches and Circuit Breakers

1. Circuit breakers shall be used in lieu of fuses throughout, including disconnect switches.
2. Where feasible, all protective devices shall be circuit breaker type. An enclosed circuit breaker is to be used in preference to a fused safety switch. Non-fused safety switches may be acceptable for local equipment maintenance disconnection.

26 29 00 Low-Voltage Controllers

26 29 23 Variable Frequency Motor Controllers

All VFD's to be manufactured by ABB. Provide by-passes for critical operations only.

26 32 00 Packaged Generator Assemblies

26 32 13 Engine Generators

1. Provide SRS with manufacturer specifications, including air emission rates, at least 4 months before construction to allow time to obtain the required air quality permit prior to equipment installation.
2. Is Generator shall be shown in proper scale and location. ~~with. Is the~~ location suitable for maintenance and appearance.
3. Bollards ~~specified~~ shall be provided where required for physical protection.

4. ~~Does the fuel selection satisfy SRS requirements; anticipate that natural gas will be the primary fuel unless another fuel is specifically required~~ Diesel shall be the fuel source, if generator services life safety loads. Otherwise, a natural gas generator may be used.
5. *Provide diesel Tier II (Tier III, if available) unit.*
6. Power and alarm conduit and wiring to generator, jacket water heater, battery charger, GFCI maintenance outlet, etc.
7. ~~Residential~~ Quietest standard muffler/oxidizing catalyst/particular filter shall be specified. Additionally, depending upon location, provide sound-attenuated enclosure.
8. ~~Is a~~ Remote generator operating indicating panel may be desirable depending upon the specific project. ~~included and is its location satisfactory~~
9. ~~Is~~ Transfer switch shall be properly located and ~~are~~ power conduit and wiring indicated.
10. Generator loads should include calculations for IT. IT should be included in the electrical distribution load of the generator.

26 51 00 Lighting

26 51 00 Interior Lighting

26 51 13 Interior Lighting Fixtures, Lamps and Ballasts

1. All fluorescent light fixtures installed must be provided with high frequency, instant start, high p.f., low THD, electronic ballasts and applicable (i.e. T-8 or compact fluorescent) lamps. Where lamps will be frequently switched or controlled by occupancy sensors, ballasts shall be high frequency, program rapid-start type.
2. All fluorescent light fixtures must be provided with a full coverage lens, or clear "tube protectors". Open lamp strip fixtures will be accepted only after specific approval.
3. All multi-lamp ballasts must be of the "Parallel circuit" type. Lamp color shall be as approved by UNM.
4. "U-lamp" light fixtures shall NOT be installed.
5. Special areas (conference rooms, etc.) shall have suitable lighting for presentations.
6. Lamp CRI and CCT shall be specified, scheduled for each luminaire type.
7. Ceiling types, grid layout and luminaire layout shall be coordinated with Architectural drawings. Base sheet shall match.
8. ~~Emergency egress~~ 24 x 7 "night" lighting shall be minimized for energy conservation.
9. Lighting shall comply with the most recent recommendations of the Illuminating Society of America.

26 53 00 Exit Signs

1. All Exit lighting will be standardized. The standardization will apply to the EXIT sign housing, lettering and color. All EXIT signs will meet the size criteria of NFPA 101. ~~All housings will be white and the signs will incorporate the GREEN colored lettering.~~ Exit signs shall be LED type.
2. Exit signs and egress lighting shall be shown in appropriate locations.
3. All exit lighting will be internally lit with battery back up power or shall be connected to an emergency source of power, which will provide not less than 1-1/2hrs of continuous power in the event of main building power failure.
4. Exit signs with attached emergency ~~light packs~~ lighting heads will not be acceptable unless specifically approved
5. Battery packs shall be provided with RCT (remote control test) feature.
6. No radioluminescent EXIT signs shall be installed.

26 56 00 Exterior Lighting

1. Exterior light fixtures shall comply with the UNM lighting master plan.
2. NM Night Sky Protection Act shall be complied with (i.e., fully shielded luminaires). ~~Additionally, house-side shields~~ Additional shielding shall be provided for luminaires near residential housing and Astronomy Observatory.
3. Electric signs shall be indicated where required and power shall be shown for electric signs.
4. Time clocks shall be of the remotely programmable electronic type and shall be capable of being interfaced with the HVAC system

26 56 13 Lighting Poles and Standards

Light poles shall have raised bases if potentially subject to vehicular damage. Light pole base detail(s) shall be shown. In ground base depth shall be at least 1/4 length of pole

26 56 16 Parking Lighting

Parking lot lighting shall be shown if required. The lighting control method shall be indicated and appropriate. Luminaires shall be compatible (source, finish, appearance) with adjacent existing lighting where so directed by PPD E&ES. Otherwise, ~~master plan and shall~~ comply with the campus lighting master plan

DIVISION 27 – COMMUNICATIONS

Please refer to the UNM ITS Design Guidelines and Guide Specifications available at http://unm.edu/communications/design-guidelines/ for complete specifications pursuant to this division. The items included herein are only intended as a partial summary and shall not be considered to supersede anything in the ITS Design Guidelines.

27 10 00 Structured Cabling

Project requirements shall be coordinated with UNM ITS to ensure that it is understood how cabling, jacks, plates, equipment racks, etc., are included and funded for the project.

27 11 00 Communications Equipment Room Fittings

1. IT closets and rooms shall be constructed of at least a one-hour fire barrier, regardless of the construction requirements of the rest of the building. The closet door will be solid core (or fire rated metal) and be labeled for at least 20 minutes unless a higher requirement is called for by code, with a self-closing device. Doorstops will not be installed on the door. NOTE: magnetic hold open devices may be installed per NFPA 101 and 80 and connected to the fire alarm system.
2. The electrical installation for IT rooms shall comply with NFPA NEC 75 or may also comply with NEC 645. One may have an advantage over the other.
3. It is recommended that the main IT service entry room (at least) be equipped with a single room electrical shut off button for all equipment (dedicated room subpanel is suggested). A second shut-off is required for dedicated HVAC equipment. The on floor generally smaller rooms need not have this feature so long as compliance with other applicable code requirements are met.
4. Ensure that telecommunications rooms are appropriately sized & located.
5. Adequate cooling ~~ventilation~~ (24/7) shall be provided for telecommunications rooms, typically using split systems. (Note that the campus chilled water system is taken down a couple of times each year for maintenance.)
6. Pathways shall be provided for cabling runs back to telecommunications rooms.

27 15 00 Communications Horizontal Cabling

Pathways shall be provided for cabling runs through hard ceiling areas.

27 30 00 Voice Communications

27 32 00 Voice Communications Telephone Sets, Facsimiles and Modems

1. Telephones shall be installed in elevator cabs.
2. Adequate handicap telephones shall be indicated.

3. Code Blue phones shall be indicated. Telephone and power service shall be shown to Code Blue stations.

27 50 00 Distributed Communications and Monitoring

27 53 00 Distributed Systems

27 53 13 Clock Systems

A clock system ~~Clocks~~ where required shall be a GPS wireless clock system consisting of a roof mounted GPS signal receiving device with cabling to a master FM radio transmitter. ~~and~~ Clocks shall be 110 volt hard-wired. ~~clocks~~ Coordinate clock types (analog vs digital) and display type (6 digit vs 4 digit) with building users and their needs. The transmitter shall include a battery back up. The system shall be similar to one manufactured by Primex Wireless or approved equal.

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

28 20 00 Electronic Surveillance

28 23 00 Video Surveillance

Exterior CCTV cameras shall be shown if required.

28 30 00 Electronic Detection and Alarm

28 31 00 Fire Detection and Alarm

1. The work covered by this section of the Specification shall include all labor, equipment, materials and services to furnish and install a complete fire alarm system of the "addressable" type. It shall be complete with all-necessary hardware, software and memory specifically tailored for this installation. It shall be possible to permanently modify the software on site by using a plug-in programmer-computer. The system shall consist of, but not be limited to, the following:

    a. Fire Alarm Control Panel
    b. Remote ~~Annunciator~~ annunciator(s)
    c. Addressable manual fire alarm stations
    d. Addressable area smoke detectors, with sensitivity maintenance alert
    e. Beam detectors
    f. Addressable duct smoke detectors, with sensitivity maintain alert
    g. Addressable heat detectors
    h. Sprinkler waterflow alarm switches
    i. Audible notification appliances
    j. Visual notification appliances
    k. Air handling systems shutdown control
    l. Smoke exhaust systems startup control
    m. Magnetic door holder release
    n. Sprinkler supervisory switches and tamper switch supervision
    o. Fire pump supervision

2. Fire alarm shop drawings shall be reviewed and approved by the design engineer.

3. The final shop drawings shall also be transmitted to the State Fire Marshal's office for review in accordance with the State Fire Marshal's Plans Review and Submittal Requirements, the latest edition. Proof of submission is necessary so that work can commence. Due to staffing, the Fire Marshal may not be able to review the drawings on a timely basis and therefore, the Design engineer's review and approval will be sufficient to start work.

4. The contractor will coordinate with ITS Alarms prior to start of work on any new or existing fire alarm system in order to alert SRS and UNM agencies.

5. Contractor shall advise building occupants that a fire alarm system may be out of service.

6. The architect must consider the location of future furnishing when locating fire alarm notification devices. Consideration must be given to furnishings obstructing the devices.

7. All fire protection systems will receive a 100% device operational test, performed by the installing contractor and witnessed by a UNM representative. The test will include activation of each pull station, smoke detector, flow tamper switch, alarm notification device and connection through the fire alarm panel to Campus Police dispatch.

8. Be sure to require that the "alarm" contractor coordinate work in this section with all related trades. Work, and or equipment provided in other sections and related to the fire alarm system shall include, but not be limited to:

   a. Sprinkler waterflow and supervisory switches shall be furnished and installed by the plumbing contractor or fire alarm contractor, and wired by the fire alarm contractor.
   b. Duct smoke detectors shall be furnished, wired and connected by the fire alarm contractor. ~~The~~
   c. HVAC contractor shall furnish necessary duct opening and installation of the duct smoke detectors. Air handling and smoke exhaust system fan control circuits and status contacts to be furnished by the HVAC control equipment contractor or as shown on the contract drawings specifically for this project.
   d. Elevator recall control circuits to be provided by the elevator control equipment.
   e. The sprinkler system control equipment contractor shall provide wet pipe flow and tamper switches, dry pipe deluge sprinkler system release valve control circuits and supervision contacts.
   f. Emergency generator supervision contacts to be provided by the emergency generator control equipment.
   g. Fire Pump supervision contact to be provided by the fire pump control equipment.
   h. Wiring, cabling and conduit shall conform to the specifications set forth in Division 26.

9. Warranty. Manufacturer shall guarantee the system equipment for a period of one (1) year from the date of final acceptance of the system. The contractor shall

guarantee all wiring and raceways to be free from inherent mechanical or electrical defects for one (1) year from date of acceptance of the system. Upon completion of the installation of fire alarm system equipment, the electrical contractor shall provide to the architect a signed written statement substantially in form as follows: "The undersigned, having engaged as the Electrical Contractor on the (name of project) confirms that the fire alarm system equipment was installed in accordance with the wiring diagrams, instructions and directions provided to us by the manufacturer."

10. Circuiting Guidelines. Each circuit shall complete as shown on drawings, but device loading is not to exceed 80% of loop capacity, in order to leave for space for future devices.

~~11.~~ Manufacturers. Notifier or EST. No exceptions. . ~~Simplex, Fire Lite, Pyrotronics or approved substitute.~~

28 31 13 Fire Detection and Alarm Control, GUI and Logic Systems

Main fire alarm panel location shall be indicated and appropriate

All FA systems will be the addressable type. Each device will report in as a separate address. The contractor will be responsible for programming the address according to the needs of UNM ITS Alarms.

This theory of operation is provided for the designer's information:

a) Actuation of any manual fire alarm station or automatic detector will sound all audio/visual alarms and trip the master fire alarm panel.
b) Actuation of automatic detectors in the elevator lobbies, shaft, or equipment room will sound all audio/visual alarms, trip the master fire alarm panel, and activate the elevator controls as directed by the elevator installer
c) Activation of a HVAC unit smoke detector will sound all audio/visual alarms, trip the master fire alarm panel and shut down the HVAC unit directly, not through the temperature control system.
d) Actuation of a sprinkler flow switch will sound all audio/visual alarms and trip the master fire alarm panel.
e) Closure of any sprinkler system valve or the PIV valve will report as a supervisory signal
f) Closure of HVAC "dampers" will report as a supervisory signal.

28 31 23 Fire Detection and Alarm Annunciation Panels and Fire Stations

1. Remote annunciator(s) shall be shown.
2. The manufacturer must have received prior approval of their fire alarm system before their system will be considered for use. Prior approval submittal shall

include system operation description, equipment cut sheets, and typical wiring diagrams.

3. Applicable Codes and Standards. All equipment shall be UL listed for its intended use. Installation of equipment and operation of, shall comply with NFPA 72, the National Electric Code, all other local codes and authorities having jurisdiction.
4. Circuit Identification Nameplates. All circuit breakers related to the fire alarm system shall have a red marking, be identified as "Fire Alarm Circuit Control".
5. Include in the technical requirements that ~~an~~ a $5 allowance ~~of $10,000 (or a quantity of 20% of those shown on drawings)~~ for additional contractor furnished fire alarm signals beyond those required by the documents or approved shop drawings. The installation shall occur after initial testing and in areas where signals can not be heard properly.
6. The system's capacity and battery system shall be sized to accommodate the extra (20%) devices.
7. Specify spare parts for the system. The spare parts shall directly interchange with the corresponding components as furnished in the installed systems. Spare parts and accessories shall be suitably packaged and identified by nameplate, stamping or tagging. Provide the following spare parts and accessories.
   a) 1 spare pull station
   b) 1 spare horn/strobe
   c) 1 spare "module"
   d) 1 spare of each type of smoke detector installed (ion, photo)
   e) 1 heat detector
8. The contractor shall furnish a list of all other spare parts and accessories which the manufacturer recommends to be stocked for maintenance of the system.

28 31 33.13 Fire Detection and Annunciation Interfaces to Remote Monitoring

Central Station Dialer. Furnish and install digital alarm dialer, which is compatible with the UNM central station alarm reporting system. (911Notifier or approved equal).

Tests

a) The entire fire alarm system shall be tested and adjusted under the supervision of a factory-trained representative of the manufacturer. Any defects shall be corrected at once and the test re-conducted.

b) After the completion of the installation and supplier's testing, the entire system, devices, wiring, and equipment shall be completely tested in the presence of the architect's representative, State Fire Marshal ~~Fire Department~~, and owner. If the system fails to pass this inspection, the contractor shall be liable for all additional re -

inspection and re-testing expenses. The Fire Marshal must approve the entire Fire Alarm System before it will be accepted.

~~28 31 46 Smoke Detection Sensors~~

~~The minimum detection and protection requirements for storage, custodial and trash rooms will be smoke detection and wet pipe fire sprinkler systems connected to the fire alarm panel.~~

28 31 43 Fire Detection Sensors

Smoke fire duct detectors shall be shown and coordinated with mechanical and not double specified (i.e., by both MECH and ELECT).

Regardless of Code requirements, provide smoke detection in lounges, break areas, electrical & IT rooms, mechanical rooms, custodial/janitor's closets, storage rooms, records rooms, trash/recycling rooms, etc. Those rooms which are subject to false alarms caused by dirt or vapors (e.g., mechanical rooms, custodial closets, break areas with microwaves, etc.) shall be equipped with heat detection, in lieu of smoke detection.

Storage, custodial and trash rooms shall be connected to a wet pipe fire sprinkler system.

28 31 53 Fire Alarm Initiating Devices

Fire sprinkler system monitoring shall be shown.

DIVISION 31 – EARTHWORK

31 01 00 Maintenance of Earthwork

Protect excavation from surface water

31 06 00 Schedules for Earthwork

Over excavation, placement of engineered fill, and compaction to 95% shall be clearly specified.

31 06 20 Schedules for Earth Moving

31 06 20.16 Backfill Material Schedule

1. Is backfill material and lift depths specified (8-inches minimum)
2. The ~~architect's~~ geotechnical engineer's written approval is required for use of spoils as backfill. If written approval is not received, acceptable imported fill material is required

31 06 40 Schedules for Shoring and Underpinning

~~Remove excavation support-shoring to a minimum depth of 48" below finish soil grade~~. In any excavation shoring is required at any depth equal or greater to 48".

31 30 00 Earthwork Methods

31 35 00 Slope Protection

Avoid steeply sloped site development. Max slope acceptable is 3 to 1.

31 60 00 Special Foundations and Load-Bearing Elements

All slabs and sidewalks adjacent to buildings - especially at door openings - are to be supported by the building foundation to avoid differential settling

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 01 00 Operation and Maintenance of Exterior Improvements

32 01 80 Operation and Maintenance of Irrigation

1. All irrigation systems must be installed in accordance with the UNM Irrigation Specifications maintained by UNM PPD Grounds & Landscaping. Copies may be obtained by contacting that division at (505) 277-2421.
2. Protect existing irrigation systems and restore immediately if damaged. Hand watering is required if irrigation is unavailable for any reason. Coordinate requirements with PPD Grounds & Landscaping prior to start of work.
3. Indicate that new irrigation and/or sleeves shall be installed beneath sidewalk prior to concrete placement
4. Ensure that there is no irrigation needed immediately adjacent to buildings.

32 01 90 Operation and Maintenance of Planting

32 01 90.33 Tree and Shrub Preservation

1. Trees to remain positively protected to drip line with sturdy fencing
2. Existing trees to remain must be protected to drip line. Other landscaping features shall be protected.
3. All disturbed features shall be restored unless specified otherwise.

32 01 90.16 Amending Soils

All soils must be amended per the Soil Preparation specifications maintained by UNM PPD Grounds & Landscaping. Copies may be obtained by contacting that division at (505) 277-2421

32 10 00 Bases, Ballasts and Paving

1. Indicate that concrete paving, sidewalks and brick pavers shall be replaced in full panel sizes with colors and patterns to match what was removed and or existing. Remove existing concrete to the nearest joint, score, or edge. Straight saw-cut edges are required. Random cuts or patches are not allowed. Score joints shall be at no more than six (6') foot intervals or match existing. Expansion joints shall be at no more than twenty (20') foot intervals.
2. Sidewalks less than 6' wide, or work within a walkway 4' wide to 6' wide - Provide and install 6" X 6" - W2.9 X W2.9 wire mesh centered on slab. Slabs shall be of four (4") inch thick 4000 psi concrete.
3. Sidewalks 6' wide or greater, or work within a walkway 6' wide or greater Provide and install #3 Rebar at 12" on center each way centered on slab. Provide

and install #3 rebar along edges of slab, provide 2" cover. Slabs shall be of 6" thick 4000 psi concrete

4. Ensure that building aprons slope away from building.

32 11 00 Base Courses

32 11 13 Subgrade Modifications

Subgrade under sidewalks shall be scarified to a depth of eight (8") inches and recompacted to minimum of 95% maximum density as determined by ASTM D 1557. Any soft or 'spongy' areas shall be removed and replaced with structural fill as described herein.

DIVISION 33 - UTILITIES

33 01 00 Operation and Maintenance of Utilities

1. If utility shutdowns are required, the contractor shall obtain approval not less than 10 days prior.
2. Indicate that existing utilities must be disconnected and capped at locations identified on the drawings or removed. Record actual disconnection locations and abandoned lines on as-built drawings.
3. Sporting and locating existing utilities and underground installations shall comply with the NMSA 1978 (New Mexico Excavation Law) and the requirements of the UNM General Conditions. In addition to One-Call compliance, include noting that utility locating is also the responsibility of contractor and is delegated by the documents. Also, utility locating by other parties does not relieve the contractor of this responsibility. Be sure these requirements are clearly indicated. Verify with UNM that the Project Manual and drawings are clear and do not issue conflicting requirements.
4. Buildings shall be sited to minimize disruption to UNM-owned utilities and especially to avoid compromising the utility tunnels.

33 06 00 Schedules for Utilities

1. Proper pipe-bedding material shall be specified. Bed pipe continuously along entire length, scoop out for bells & fittings. Proper depth of backfill around pipe shall be specified. Backfill to be compacted beneath pipe haunches before additional backfill is added
2. Check to make sure that new utility lines are in compliance with UNM Utility Master Plans.
3. Clearly indicate the utility point of connection to the building, including size, routing and shutoff valves where appropriate for steam and condensate, chilled water, domestic water, fire sprinkler service, fire department siamese connections, sanitary sewer, storm sewer, etc.
4. Specify that an approved warning tape shall be installed above utilities, twelve (12") inches beneath finished grade. Specify that a magnetic traceable warning tape or tracer wire shall be provided with appropriate test connection points for all wet lines
5. All new underground utilities shall have a brass crap placed above all bends and tees and for long runs will be placed every 100 feet. The brass cap shall note the utility and have arrows showing where the utilities lines are going.

33 09 00 Instrumentation and Control for Utilities

1. Building boundary metering of all utility demand and consumption is required. Monitoring of both instantaneous and cumulative consumption shall be available

through the building DDC system. In selected cases, metering and monitoring of individual HVAC units may be required

2. Refer to the UNM-PPD Utilities Division Metering Equipment Guideline for detailed metering specifications. Copies may be obtained by contacting that division at (505) 277-1142

33 10 00 Water Utilities

All design calculations excluding fire suppression systems shall be based on a system static pressure of 65 psi. The designer must review the October 2008 UNM Water Master Plan for the appropriate connection points and necessary extensions to provide service to their project.

33 11 00 Water Utility Distribution Piping

1. Specify lined ductile iron pipe (DIP) for domestic supply piping.
2. Pipe to be delivered with factory-installed end caps, which remain in place until pipe is installed and until necessary to remove to install next piece of pipe. No damaged components are to be installed. Pipe lining to be intact
3. Plastic piping is to be protected from sunlight
4. Only mechanical joint restraint fittings and valves are acceptable. No joint restraint gaskets accepted
5. Corrosion protective encasement for direct-buried piping (PE film) is required
6. Specify non-rising stem, resilient seat, mechanical joint gate valves, 250 psig
7. Specify tees, not tapping sleeves
8. Bury valves four (4') feet below grade so that valve stem extensions are avoided.
9. Valves and stems must be in a City of Albuquerque specified valve box .
10. Conduct piping pressure tests before joints are covered. Pressure test piping at not less than 1 ½ times working pressure for 2 hours. Piping pressure tests to be witnessed and signed off on by the designated construction observer. . This data must be included in the project close-out documents.

33 11 19 Fire Suppression Utility Water Distribution Piping

1. All design calculations shall be based on a system static pressure up stream of the backflow preventer of 65 psi
2. Specify lined ductile iron pipe (DIP) for fire supply piping Corrosion protective encasement for direct-buried piping (PE film) is required.
3. Specify non-rising stem, resilient seat, mechanical joint gate valves, 250 psig
4. Specify tees, not tapping sleeves.
5. All normally unoccupied spaces will be protected with a smoke detector and sprinkler head regardless of the protection requirements of the rest of the building. Both systems will be connected to the buildings fire alarm system. A

heat detector (no higher than 135°) may be substituted where appropriate and with approval, i.e steam production from the custodial sink, areas with blowing dust, etc.

6. Drains and test connections shall be grouped in a reasonable fashion for ease of testing and control of discharged water. Hose connections will be provided.

33 12 00 Water Utility Distribution Equipment

33 12 13 Water Service Connections

Coordinate connection to the existing water main with the PPD Utilities Division or City of Albuquerque, as appropriate.

33 12 13.13 Water Supply Backflow Preventer Assemblies

Backflow preventers shall be installed where needed. Provide required hot box backflow protection for domestic, fire and irrigation water as required.

33 12 33 Water Utility Metering

Indicate a building water meter and location. Be sure it is coordinated with the building EMS and PPD Utility Division specifications. Refer to the UNM-PPD Utilities Division Metering Equipment Guideline for detailed metering specifications.

33 12 19 Water Utility Distribution Fire Hydrants

Specify fire hydrant location and verify adequate access.

Insure that Fire Department Siamese connections are properly located and accessible.

33 13 00 Disinfecting of Water Utility Distribution

NMED Certified Technicians must supervise the sanitizing of new connections to UNM's drinking water utility system. Use AWWA C651 procedure or alternate for purging & disinfection BAC-T tests by independent labs.

33 30 00 Sanitary Sewerage Utilities

Provide manholes at all direction changes

33 31 00 Sanitary Utility Sewerage Piping

33 40 00 Storm Drainage Utilities

All projects must include a drawing indicating existing conditions. Contour lines must be included with flow areas and locate and call-out all drainage infrastructures.

On a separate drawing the proposed improvements must be shown with revised contour lines and flow arrows. The drawing should show all new infrastructure and indicate how that infrastructure will connect to existing infrastructure.

All drainage calculations shall be in accordance with the City of Albuquerque's DPM Section 22.2

All projects shall have a table on the proposed improvements must have a table illustrating the existing condition and the 20 and 100 year drainage calculations for the current situation and the proposed project.

Include all site surface drainage structures, inlets, etc. in the project.

1. Indicate the site surface drainage course(s). Provide adequate drainage away from the building, including but not limited to roof drains, landscaped areas, drive pads, sidewalks

Indicate required subsurface drainage: drop inlets, drain inlets, manholes, storm sewers, etc. Subsurface drainage should be outside the building structures foundations area of influence.

2. Indicate finished floor elevations relative to grade at building. Avoid setting elevations too low.
3. Indicate an adequate water-harvesting plan consisting of swales, retention facilities, volume control, overflow considerations, etc. Roof drains should direct water into plantings or be used for other beneficial uses whenever possible before discharge to the storm disposal system.
4. Indicate new and existing inverts and grades
5. Avoid situations requiring a sump pump
6. Provide manholes at all direction changes

Use of sump pump should be the alternative of last resort. In order to use this approach a life cycle cost estimate of a sump pump and any other alternative must be completed. If the sump pump life cycle cost is not the lowest cost to UNM they may not be used.

33 50 00 Fuel Distribution Utilities

33 51 00 Natural-Gas Distribution

1. Connect to UNM system if at all possible
2. Avoid installing new gas piping in the utility tunnel
3. Piping and shut-offs to comply with code.

33 51 33 Natural-Gas Metering

Refer to the UNM-PPD Utilities Division Metering Equipment Guideline for detailed metering specifications.

33 60 00 Hydronic and Steam Energy Utilities

33 61 00 Hydronic Energy Distribution

1. Chilled water shall be supplied at 42°F. and shall return at not less than 58°F.
2. System chilled water pressure is adequate to satisfy most building circulation requirements (no building chilled water pumps are required).
3. ~~Design chilled water differential pressure at the buildings is 15 psig.~~
4. Winter months' cooling requirements must be able to be met with 50°F chilled water supply as the central plant hydronic economizer cycle is used.

33 61 33 Hydronic Energy Distribution Metering

Refer to the UNM-PPD Utilities Division Metering Equipment Guideline for detailed metering specifications

33 63 00 Steam Energy Distribution

Steam shall be supplied to buildings at a pressure of 40 psig. However, the pressure reducing station shall accommodate (with adjustment) future supply pressures up to 110 psig.

33 63 33 Steam Energy Distribution Metering

Refer to the UNM-PPD Utilities Division Metering Equipment Guideline for detailed metering specifications

33 70 00 Electrical Utilities

1. Identify the location of primary pad-mount switch and pad-mount transformer.
2. Ensure that the locations ~~is~~ are suitable for maintenance and minimizes impact on appearance.
3. Provide adequate working clearances, access and drainage.
4. An enclosure shall be provided where required.
5. Pad-mount transformer(s) shall have 12.47 kV delta-wye connection. Transformers will be OFCL.
6. Transformer(s) will be provided with feed-thru bushing inserts. Specify that contractor is to provide elbow connections and elbow ~~shall be provided with~~ surge arresters.
7. Spare conduit stubout(s) shall be indicated.

8. Primary equipment designation(s) shall be obtained from UNM PPD Engineering and shown correctly
9. Power connection points shall be identified, both at ~~vaults~~ manholes and building
10. UNM has a dual-radial 12.47kVprimary electrical distribution system. Two primary circuits and adequate conduits shall be specified. Additionally, a 2" empty conduit system shall be provided throughout the B circuit manholes and to primary switches for future SCADA. ~~Vaults~~ Manholes shall be provided where needed
11. Bollards shall be ~~specified indicated~~ where required to protect switches and transformers.
12. A single perimeter ground counterpoise shall be detailed for transformer and switch.
13. If appropriate, a perimeter ground counterpoise shall be detailed for building and properly interconnected.
14. Power and alarm conduit and wiring to sprinkler controls, hot boxes and backflow preventers shall be indicated.
15. Paint color of exterior equipment and devices shall be suitable for environment. (i.e., match building colors for exposed devices). Factory "Desert Tan" finish will be provided on OFCI ~~required for~~ transformers and primary switches.
16. PIV and supervisory tamper switch locations shown shall be along with tie to fire alarm system.

33 71 00 Electrical Utility Transmission and Distribution

33 71 19 Electrical Underground Ducts and Manholes

1. In all PVC conduit ductbank runs, all bends over 30 degrees and all stub-ups shall be in wrapped rigid conduit and properly grounded.
2. PVC conduit/ductbank runs shall transition to wrapped rigid conduit at entries into manholes and buildings. Associates ductbanks shall be doweled into manholes and basement building walls. Linkseals shall be used to seal conduit entries into building basements.
3. A 4/0 bare copper ground conductor shall be provided in all electrical and telecommunications ductbanks, and shall ring the perimeter of each manhole and pullbox, and terminate at primary switches.
4. A 2" empty conduit shall be provided from the existing B circuit manhole to the new primary switch (for future SCADA).
5. Removal of abandoned conduit that is underground must be indicated.
6. Coordinate with UNM-PPD to determine the extent of removal work.

33 71 73 Electrical Utility Services

33 71 73.33 Electric Meters

1. UNM required electric meter shall be a Square D POWERLOGIC

~~CM3350 ECC2~~ PM870 connected at main secondary electrical service

2. More than one electric meter may be required, depending upon the number of electrical services to the building, and possibly for tenant metering. Exact requirements shall be reviewed and approved by UNM PPD.
3. ~~All metering shall be connected thru the building DDC system.~~ Meter(s) must be able to be read remotely by UNM personnel. The meter shall be connected to the Building Utilities Monitoring Panel (BUMP), if one is required to be provided for the building. Otherwise, the meter shall be furnished with an Ethernet communications card and connected to a LAN outlet.
4. Refer to the UNM-PPD Utilities Division Metering Equipment Guideline for further metering specifications.

33 73 00 Utility Transformers

If the transformer contains a secondary CB, appropriate modifications to neutrals and grounds shall be specified.

33 73 13 Liquid-Filled Utility Transformers

Existing oil-filled transformers may contain PCB's. Determine through SRS if transformers in the project contain PCB's and if so, properly and legally dispose of them and provide UNM-SRS with the appropriate legally-required documentation.

New OFCI pad-mount transformers will be supplied filled with natural ester less flammable liquid.

33 77 00 Medium-Voltage Utility Switchgear and Protection Devices

Pad-mount primary electric switches will be OFCI, and typically 4-way (2-in, 2-out). If a different configuration is anticipated to be required, discuss with PPD Engineering. ~~The correct power switch shall be specified including manufacturer and configuration.~~

33 79 00 Site Grounding

Only approved exothermic or compression ~~pressure~~ type ground connections shall be specified. UNM prefers compression type connections for all connections except those made to ground rods.

33 79 93 Site Lightning Protection

1. If system is desired by UNM, based upon importance of the building and/or hazard ~~required~~, it must be shown.

iii) If system is provided, then certification is required ~~then~~ Specify whether UL or LPI certification is required. ~~must be specified~~

33 80 00 Communications Utilities

Please refer to the UNM ITS Design Guidelines and Guide Specifications available at http://its.unm.edu/communications/designguidelines/ for complete specifications pursuant to this section. The items included herein are only intended as a partial summary and shall not be considered to supersede anything in the ITS Design Guidelines.

33 81 00 Communications Structures

33 81 26 Communication Underground Ducts, Manholes and Handholes

1. Telecom ductbank and ~~vaults~~ manholes/pullboxes shall be indicated.
2. PVC conduit/ductbank runs shall transition to wrapped rigid conduit at entries into manholes/pullboxes and buildings. Associates ductbanks shall be doweled into manholes and basement building walls. Linkseals shall be used to seal conduit entries into building basements.
3. A 4/0 bare copper ground conductor shall be provided in all electrical and telecommunications ductbanks, and shall ring the perimeter of each manhole and pullbox..
4. Fiberglass manholes/handleholes are not permitted. All manholes shall have a 36" round steel lid with chimney. See UNM ITS Design Guidelines for further details.

33 82 00 Communications Distribution

1. Telephone service tie-in point shall be shown and the location coordinated with UNM ITS .
2. Data service tie-in point shall be shown and the location coordinated with UNM ITS
3. Conduit stubouts into building shall be shown.
4. Cable TV service tie-in point shall be shown, if desired or required.

DIVISION 40 – PROCESS INTEGRATION

Combustion Equipment - Provide SRS with manufacturer specifications, including air emission rates, at least 4 months before construction to allow time to obtain the required air quality permit prior to equipment installation

NEW MEXICO ENVIRONMENTAL REGULATIONS FOR DESIGN PROFESSIONALS

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I. OVERVIEW OF ENVIRONMENTAL REGULATION

The regulatory climate for development has changed markedly in the past decade. In addition to zoning and subdivision issues, the astute developer must analyze a multitude of environmental issues prior to reducing the project to a blueprint. As recently as ten years ago, most development projects were shelved permanently if an initial investigation revealed existing environmental problems which potentially implicated liabilities under the far-reaching federal and state regulatory schemes. Financing for these projects could not be obtained, and no one, including the developer itself, was desirous of inheriting a project laden with potential environmental liabilities.

Times have changed at a pace that is remarkable in the regulatory field. The United States Environmental Protection Agency ("EPA") has itself recognized the impediment to development that the Superfund, or Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ("CERCLA"), has imposed on innocent parties. Congress has finally vested lenders with a true "safe harbor," and the advent of brownfields legislation and guidance documents have encouraged, rather than frustrated, the development of environmentally blighted properties. In fact, the regulatory agencies have shifted their focus from an "all-out" remedial effort to a "risk based" response designed to assist developers in placing the property to its highest and best use.

This paper will review a common sense approach to developing an environmental baseline, which segregates existing environmental conditions from those which may develop after the closing of the purchase of the property. After discussion of the environmental baseline, this paper will address the primary environmental permits necessary for a successful development, including air quality, hazardous waste, and wetlands issues. This presentation will then highlight the historical theories of liability and the limited defenses to environmental claims asserted under federal law, and compare that history to the recent judicial trend of expanding those defenses and thereby encouraging property development. Finally, the ability to "reuse" environmentally impaired properties will be discussed. The development of these impaired properties, commonly known as "brownfields," will be affected by the structure of the environmental baseline, the relief afforded to lenders providing the financing for the project, and by the recent judicial limitations on liability and the expansion of defenses available under federal law.

II. ACCOMMODATING NATURAL RESOURCE PROTECTION LAWS

In virtually every business development transaction, potential environmental liability is a risk that must be appropriately assessed. As the discussion of the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. 9601 et seq. ("CERCLA") in part V below indicates, liability is frequently based not as much on fault as on ability to pay. Additionally, future laws may impose potential construction or operational restrictions which may deprive a proposed project of economic viability. The role of the environmental attorney is to ensure that these risks are managed to achieve maximum value.

Environmental risks in buying or selling real estate can be segregated into the following four categories: (i) existing contamination of purchased property, which is largely governed by CERCLA; (ii) third-party claims which may be asserted by neighboring land owners; (iii) operational restrictions, including obtaining necessary environmental permits and compliance with those permits; and (iv) enforcement actions, which may be instituted by an agency or an aggrieved citizen based on activities which preceded the purchase.

A. Due Diligence

The EPA defines "brownfields" as "abandoned, idled, under-used industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination."[1] Brownfields can be empty warehouses and factories or contaminated, junk-filled lots. While many factors have caused investors to shy away from brownfields properties, CERCLA created the essential risk associated with ownership of previously contaminated sites. As discussed in the prior section, CERCLA's liability scheme imposed harsh liability for the costs of clean-ups on a number of "responsible parties," including current owners and operators of a contaminated site who arguably had nothing to do with the contamination. Against this backdrop, the unattractiveness of an old industrial or commercial site is readily understandable.

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[1] *See* Brownfields Economic Redevelopment Initiative (September of 1995). The term "brownfield" is also defined by statute in Section 101 of the CERCLA as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant." See 42 U.S.C. § 9601(39) (also identifying nine specific types of properties that are excluded from this definition).

The EPA has responded to CERCLA's significant impediment to the development of brownfield properties, which are often located in low income or other depressed areas. In 1995, the EPA began its Brownfields Program to change the way people think about contaminated properties. The Program was designed to be flexible so that communities could tailor approaches to meet their unique local needs. The heart of the EPA's Brownfields Program[7] is its investment in Brownfields Pilots, three types of programs that provide "seed" money to state and local entities for the assessment, cleanup, and redevelopment of brownfields. These programs include: (1) Brownfields Assessment Demonstration Pilots that fund environmental assessments of brownfields as well as local planning and community education regarding their clean up and redevelopment, (2) Brownfields Cleanup Revolving Loan Fund Pilots that provide state, local, and tribal governments with capital to make low or no interest loans to finance brownfields cleanups; and (3) Brownfields Job Training and Development Demonstration Pilots that train local residents for jobs related to brownfields cleanups.

The main focus of the EPA and of the states has been to encourage development without the risk of incurring unnecessary liability. The EPA has two primary mechanisms for the clarification and liquidation of potential liability, both of which are discussed below.

B. Comfort letters

The purpose of comfort letters is to provide prospective purchasers and others with the best, most current information about the EPA's interest, or lack thereof, in a given site. These letters summarize data available to the EPA regarding a site and, importantly, summarize the federal government's past actions and future expectations with respect to response actions at the site. The EPA will not issue a comfort letter for any property unless there is a realistic perception or a probability of a prospective new owner incurring CERCLA liability. The EPA policy, which may be found on the EPA website, sets out four types of sample comfort status letters.

a. A "no previous federal Superfund interest" letter which advises party that there is no evidence of past Superfund interest or involvement with the site (in other words, the site is not in the CERCLIS database).

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[7] Under the Brownfields Program, the EPA also partnered with states to develop Memoranda of Agreement that clarified the roles and responsibilities of agencies and encouraged the cleanup of contaminated properties. New Mexico is one of these states.

b. A "no current federal Superfund interest" which advises a prospective purchaser that this site has been deleted from CERCLIS or from the National Priorities List.

c. A "federal interest" letter which advises the prospective purchaser that the EPA is responding, or plans to respond, to contamination at a site.

d. A "State Action" letter which indicates that the State has primary responsibility for any activities at this site.

C. Prospective Purchaser Agreements ("PPAs")

In contrast to a comfort letter, a PPA provides actual resolution or liquidation of any legal liability that the prospective purchaser might incur. EPA issued its guidance on agreements with prospective purchasers of contaminated property on May 24, 1995, which states that PPAs are available only for sites where there has been, or where there realistically will be, a CERCLA response action. This standard is more restrictive than that which governs the issuance of comfort letters. The essence of a PPA is a covenant not to sue the new owner for pre-existing contamination, which is generally granted in exchange for appropriate consideration. The covenant not to sue also qualifies, pursuant to section 113(f)(2) of CERCLA, to protect the new owner from possible contribution actions by other PRPs. The EPA guidance states that in consideration of granting the covenant not to sue, the EPA should receive a substantial benefit either in the form of a cleanup, or an indirect public benefit in combination with a reduced direct benefit to EPA. Prior versions of the guidance restricted the consideration to direct benefits of cash or cleanup work. However, the current guidance recognizes the considerable indirect benefit that can be realized from brownfields redevelopment, including the creation or retention of jobs, the development of abandoned or blighted property, the creation of conservation or recreation areas, or the improvement of public transportation or infrastructure.

D. Brownfields Revitalization Act of 2002 and New Mexico Voluntary Remediation Act

On January 11, 2002, President Bush signed the Small Business Liability Relief and Brownfields Revitalization Act[3] to bring new clarity to brownfields regulation and provide government funding to assist in restoration efforts. Most significantly, the 2002 law authorizes up to $250 million in funds annually for

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[3] The full text of the Act is available from the EPA's website at www.epa.gov/brownfields

Brownfields[7] grants. The grants are administered through the EPA to encourage businesses and localities to redevelop brownfields. Generally, grants of up to $200,000 each are awarded to assess brownfields and identify creative and cost-effective means to clean-up contaminated property and restore them to productive use. In 2003, $73.1 million in grants were awarded. In 2004, the EPA announced a record $75.4 million grants to be distributed to 219 applicants, including 42 states, Puerto Rico, and 5 tribes.

The Brownfields Revitalization Act also established the Brownfields Cleanup Revolving Loan Fund (BCRLF).[8] The fund allows communities to provide funds to public and private entities for Brownfields clean up. Groups can apply for funds of up to $1 million, provided that sixty percent of the award must be used to capitalize a revolving loan of funds used in clean-up efforts. The EPA administers this fund, and has already awarded well over $100 million in grants. The loans contain escalation clauses that provide for the loan of additional cleanup funds if additional contamination is found during cleanup.

Similar to the purposes set forth in the Brownfields Law, the New Mexico Environment Department, pursuant to the New Mexico Voluntary Remediation Act[9] ("Remediation Act"), established a Voluntary Remediation Program to promote voluntary cleanup of contaminated sites. "The program is designed to facilitate redevelopment of contaminated sites by providing a streamlined, non-punitive remediation process."[10]

Any current or prospective landowner or operator can apply to participate in the program. Parties that successfully complete the program obtain a Certificate of Completion or a Conditional Certificate of Completion stating the contamination has been successfully mitigated. Parties can also receive a Covenant Not to Sue shielding the purchaser from liability. Finally, lenders are also protected from liability arising from any sites participating in the program.[11]

Cleanups conducted under the Brownfields Law or under the New Mexico

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[7] Information on borrower eligibility and loan fund conditions can be found at www.epa.gov/brownfields/blist.htm

[8] 1978 N.M. STAT. ANN. 74-4G-1.

[9] New Mexico Environment Department, *Guidance for Prospective Applicants to the Voluntary Remediation Program*, 1 (2004-05), http://www.nmenv.state.nm.us/gwb/New%20Pages/ROS_files/VRP_New/Statutes-Rules-Guidance/VRP_Prospect-App-Guide.pdf

[10] *Id.*

Environment Department's Remediation Program limit the authority of the EPA at eligible response sites.[8] The Brownfields Law prohibits the EPA from bringing an action against a person conducting, or having completed, a response action.[9] This prohibition, however, extends only to actions as to the same releases addressed by the response action. Thus, the EPA may bring a separate action as to a different release. Furthermore, the prohibition applies only to the party that conducted, or is conducting, the cleanup.[10]

E. New "All Appropriate Inquiry" Requirements

The new "All Appropriate Inquiry" rule implements the Brownfields Law. The Brownfields Law intended to clarify and add possible defenses to CERCLA's strict liability. CERCLA and the EPA had previously not defined the minimum requirements for an "all appropriate inquiry." Therefore, people relied on the practices of the American Society for Testing and Materials ("ASTM") as the standard for an "all appropriate inquiry." The new "All Appropriate Inquiry" makes significant changes to the long used ASTM E1527-00 standard, mainly by enhancing the scope of the due diligence activities. These new changes will increase the cost and time associated with performing an Environmental Site Assessment ("ESA").[11] Parties can try to minimize these expenses and additional time commitments by incorporating language into purchase agreements that would permit a purchaser, or the purchaser's environmental professional, access to the property and property records while the property is still within the seller's control.

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[8] Brownfields Law § 231(a), Pub. L. No. 107-118, 115 stat. 2356, 2375-79 (codified at 42 U.S.C. § 9628(a)(2)(B)). In order to effectively limit EPA authority, state programs must specifically govern response actions for the protection of public health and the environment. States must also maintain a public record of sites involved in remediation.

[9] Brownfields Law § 128(b)(1).

[10] As the Committee Report commentary notes, there are four exemptions to this rule which include instances where the state requests assistance in a response action, where jurisdiction and cross-jurisdiction issues may arise, when an Administrator learns that information was not previously known by that state and further remediation is necessary to protect the environment or public health. *See* Report 107-2 to accompany S. 350, Brownfields Revitalization and Environmental Restoration Act of 2001, 107th Cong., 1st Sess., Committee on Environment and Public Works, at 15-18 (Mar. 12, 2001).

[11] The EPA estimated that the cost increase will be between $41 to $48. This number, however, appears unrealistically low and does not account for environmental professionals' increase in time that will be invested into conducted a more comprehensive ESA, among other factors. *See* "Preamble" to ESA.

I. Objective of the "All Appropriate Inquiry" Site Assessment

The EPA's new "Standards for Conducting All Appropriate Inquiry"[11] rule ("Rule" or "AAI"), which takes effect on November 1, 2006, establishes a regulatory standard for performing environmental due diligence in real property transactions. The new Rule supersedes the commonly used ASTM E1527-00 standard; when the rule takes effect, parties will have to comply with the AAI requirements or follow the new ASTM E1527-05 standards.[12] The AAI serves as a crucial component to three liability defenses available under CERCLA: innocent landowner defense,[13] *bona fide* purchaser ("BFP") defense,[14] and contiguous property owner defense.[15] Parties receiving grants under the Brownfields Grant programs must also perform an AAI.[16]

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[11] 40 C.F.R. § 312.

[12] *Id.* § 312.11(a). The now superseded E1527-00 standard can still be purchased through ASTM International by visiting their website at www.astm.org. The active standard, E1527-05, can also be purchased through ASTM's website.

[13] The innocent landowner defense applies to persons who purchase property and are unaware of, or have no reason to know of, contamination existing on the property at the time of purchase. The landowner may use this defense if: 1) the owner conducted an AAI before acquiring title; 2) no contractual relationship exists between the owner and the party responsible for the contamination; and 3) the owner exercised due care with respect to hazardous substances. 42 U.S.C. § 9601(35) and § 9607(b)(3).

[14] The BFP defense applies to purchasers with prior knowledge of contamination. The purchaser may assert this defense if: 1) the purchaser conducted an inquiry prior to acquiring title; 2) disposal of all hazardous substances occurred prior to acquiring title; 3) the purchaser used "appropriate care" to prevent continued or future release; 4) the purchaser limits or prevents exposure to the contamination. 42 U.S.C. § 9601(40) and § 9607(q).

[15] A purchaser of contiguous property must not know of or have reason to know of contamination existing on the property at the time of purchase. A landowner may assert this defense if: 1) the purchaser conducted an AAI prior to acquisition; 2) the contamination resulted from hazardous substances migrating from adjacent parcels; and 3) the purchaser took "reasonable steps" and used "proper care" to prevent future releases. 42 U.S.C. § 9607(q).

[16] United States Environmental Protection Agency, *Comparison of the Final All Appropriate Inquiries Standard and the ASTM E1527-00 Environmental Site Assessment Standard* (Oct. 2005) *at* http://www.epa.gov/brownfields.

2. Standards and Practices of the "All Appropriate Inquiry" Site Assessment

An AAI requires an environmental professional to conduct an investigation of a property which includes: interviewing past and present owners, operators, and occupants; interviewing neighbors if the property is abandoned; reviewing historical sources of information; reviewing federal, state, tribal and local government records; visually inspecting the facility and adjoining properties; reviewing commonly known or reasonably ascertainable information; and evaluating the degree of obviousness of the presence or likely presence of contamination at the property and the ability to detect the contamination.[18] Although not necessarily performed by an environmental professional, an AAI must also include, searches for environmental cleanup liens; an assessment of the relationship of the purchase price to the fair market value of the property if the property was not contaminated, and an assessment of any specialized knowledge or experience of the prospective owner.[19]

The results of an AAI must be documented in a written report that includes: 1) "an opinion as to whether the inquiry has identified conditions indicative of releases or threatened releases of hazardous substances ... on, at, in, or to the subject property; 2) an identification of data gaps...that affect the ability of the environmental professional to identify conditions indicative of releases or threatened releases of hazardous substances... on, at, in, or to the subject property and comments regarding the significance of such data gaps on the...professionals' ability to provide an opinion as to whether the inquiry has identified conditions indicative of releases or threatened releases; 3) the qualifications of the environmental professional;"[20] and 4) two signed declarations.[21]

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[18] 40 C.F.R. § 312.20

[19] *Id.*

[20] *Id.* § 312.21(c).

[21] *Id.* § 312.21(d). The professional must include the following two statements: 1) "I, We declare that, to the best of my/our professional knowledge and belief, I/we meet the definition of Environmental Professional as defined in § 312.10 of this part" and 2) "I, We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I/We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312."

All AAIs must be conducted within one year of acquisition of a property. Certain components, however, must be updated within 180 days of acquisition.[22]

3. How Much Research is Enough?

As mentioned, the AAI requires more research than ASTM E1527-00. In the event that a property is abandoned, for example, the AAI rule, unlike ASTM E1527-00, requires the environmental professional to interview neighbors or nearby property owners.[23]

Furthermore, all "historical documents and records must be reviewed for the purposes of achieving the objectives and performance factors."[24] These documents, under the AAI, must "cover a period of time as far back in the history of the subject property as it can be shown that the property contained structures or from the time the property was first used for residential, agricultural, commercial, industrial, or governmental purposes."[25] This new requirement proves far more extensive than the ASTM E1527-00 standard of researching only obvious uses beginning when the property was first developed.

4. "De Minimis" Contamination

The Brownfields Law added a new liability exemption to CERCLA. The new exemption provides otherwise liable generators or transporters a qualified exemption from liability where the parties can demonstrate that, prior to April 1, 2002, the amount of hazardous substances they contributed to a CERCLA site listed on the National Priorities List ("NPL") was less than 200 pounds of solid materials or less than 110 gallons of liquid material.[26] This exemption "is similar, but not identical, to the protection previously afforded by the" EPA and U.S. Department of Justice ("DOJ") "regarding settlements with de minimis parties at Superfund sites."[27]

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[22] *Id.* § 312.20.

[23] *Compare* 40 C.F.R. § 312.23(b) *with* ASTM E1527-00.

[24] 40 C.F.R. § 312.24(a).

[25] *Id.* § 312.24(b).

[26] *See* CERCLA § 107(o).

[27] Memorandum from Barry Breen, Director, Office of Site Remediation Enforcement at EPA, and Bruce Gelber, Chief of Environmental Enforcement Section, at DOJ, to EPA directors and regional counsel 2 (Nov. 6, 2002), *available at*

This exemption, however, does not apply in certain cases.[28]

A party may still enter *de minimis* waste contributor settlements under the EPA DOJ policy. A party entering such settlements provides cleanup funds based on its share of the total waste contribution.[29] This share often includes a premium.[30] In exchange, a party may receive "a covenant not to sue and contribution protection from the United States."[31]

5. Representations and Warranties

Common subjects for representations in connection with environmental matters include the following:

a. Compliance with laws and regulations;
b. Possession and effectiveness of required permits;
c. Lack of pending or threatened enforcement actions; and
d. Lack of pending or threatened third-party claims.

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http://www.epa.gov/compliance/resources/policies/cleanup/superfund/ww-exempt-dmuro-mem.pdf. The codified exemption differs from the EPA DOJ's policy in two significant ways. First, the exemption applies only to NPL sites, while the EPA DOJ policy applied to both NPL and non-NPL sites. Second, the exemption does not apply to disposal or transport occurring after April 1, 2001, while the EPA DOJ policy did not have a date limitation. *Id.* at 4.

[28] The exemption does not apply when "the President determines that: 1) the person sent material that contributed or could contribute significantly to the cost of the response action . . . 2) the person has failed to comply with an information request or agency subpoena; 3) the person has impeded, through action or inaction, a response action . . . or 4) the person has been convicted of a criminal violation for conduct related to the exemption." *Id.* at 3.

[29] United States Environmental Protection Agency, *Superfund Enforcement FAQs* (May 2006), http://www.epa.gov/compliance/resources/faqs/cleanup/superfund/enf-faqs.html (hereinafter "Superfund FAQs"). In lieu of, or in addition to, providing funds, parties may undertake some of the cleanup work. *Id.*

[30] *See, e.g.*, *United States v. Cannons Eng'g Corp.*, 899 F.2d 79 (1st Cir. 1990) (upholding premium).

[31] *Id.*

Additionally, a buyer should require representations of the seller concerning the absence of undisclosed liabilities and whether hazardous substances have been used or stored on the property.

From the seller's perspective, an "AS IS" clause may not be sufficient to prevent the buyer from seeking reimbursement for environmental costs, as these types of clauses are generally construed against the seller. **Southland Corp. v. Ashland Oil Inc., 696 F. Supp. 994 (D.N.J. 1988)**.

6. "As Is"

Buyer agrees that, except as expressly set forth in this agreement, no representations by or on behalf of Seller have been made to Buyer as to the condition of the property, any restrictions related to the development of the property, the applicability of any governmental requirements, including, but not limited to "environmental requirements" pertaining to the property, or the suitability of the property for any purpose whatsoever. Buyer represents to Seller that Buyer has made its own independent investigation of the property and is relying solely on such independent investigation. Buyer acknowledges that Seller has no expertise concerning "environmental requirements" and "hazardous materials" and that Buyer is not relying on any representation or the lack of same, with respect to "environmental requirements" or "hazardous materials" as they apply to conditions on the property.

Through the environmental due diligence procedure, the parties are able to segregate pre-closing from post-closing liabilities. This segregation, commonly called the "Environmental Baseline," serves to establish responsibilities for environmental response costs and liabilities which are liquidated after the closing of the purchase and sale.

The following are examples of allocation and baseline provisions.

7. Environmental Allocation

Except as otherwise provided in this schedule, Seller shall be responsible for, and bear the costs of, such corrective action as may arise as a consequence of the ownership or operation of the property prior to the closing date, and Buyer shall be responsible for, and bear the cost of, such corrective action as may arise as a consequence of the ownership or operation of the property on or after the closing date. The presence or absence of hazardous substances in the soil or groundwater on the property as of the closing date, for purposes of determining the necessity of

corrective action, shall be conclusively determined by the baseline, as defined below.

8. Environmental Baseline

Except as otherwise provided, or specifically agreed to in writing, the presence or absence as of the closing date of hazardous substances in the soil or groundwater on the property, or that have migrated or may migrate from the property as a consequence of activities on or related to the property (hereinafter called the "Environmental Baseline"), shall be determined referenced to data from the environmental assessments performed by ABC Company. The Environmental Baseline shall not include the presence of substance in such quantities as are consistent with the method of operation of the property, in process equipment, storage tanks, land farm, or non-earth containment devices or of such substances as may lawfully exist as a consequence of the operation of the property ("lawful substances"). Buyer agrees to be responsible for any corrective action arising from the use of lawful substances after the closing date, and any contamination caused by those lawful substances after the closing date or related corrective action after the closing date.

III. THE ENDANGERED SPECIES ACT

A. An Overview

Congress enacted the Endangered Species Act ("ESA")[32] in 1973, amid growing concern about the detrimental effects that land use and development have upon plants and wildlife. The ESA provides the means to identify species of plants and wildlife that are threatened by development and sets forth detailed guidelines for how those species will be protected to best ensure their continued survival. Although the ESA has nationwide application, it has special implications for each state in which endangered or threatened species are at risk. The ESA's impact on several New Mexico projects has been well documented because the state is home to such endangered or threatened species as the Mexican spotted owl, the black-footed ferret, the Rio Grande silvery minnow, and the bald eagle, among others. New Mexico is inhabited by 42 species officially listed as either endangered or threatened, 29 of which are animals, and 13 are plants.[33]

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[32] 16 U.S.C. § 1531-1543

[33] FWS, Threatened and Endangered Species System, (TESS) *Specialized Species* http://ecos.fws.gov/tess_public/TESSWebpage/SpecialLists?state=NM

B. Administration

The Fish and Wildlife Service ("FWS"), in the U.S. Department of the Interior, and the National Oceanic and Atmospheric Administration ("NOAA") Fisheries, in the U.S. Department of Commerce, share responsibility for administration of the ESA.[32] The FWS operates the Listing Program, to determine whether a species should be added to the federal lists of endangered and threatened wildlife and plants. A species can become listed through one of two methods: through the petition process[33] or through the candidate assessment process.[34] The petition process allows any interested person to petition the Secretary of the Interior to add a species to the list of endangered or threatened species. In the candidate assessment process, FWS itself identifies species for the list.

Once identified as a candidate, the FWS looks to a variety of factors[35] to determine if the species should be listed and if so, whether it should be listed as endangered[36] or threatened.[37] Once the decision to list is made, the species then receives the heightened protection provided by the ESA. If possible, the FWS should designate a critical habitat concurrently with the listing of a species.[38] A critical habitat includes the areas occupied by the species, at the time it is listed, and any areas that are deemed essential to the conservation of the species.[39] Although the FWS is required to designate critical habitat for endangered or threatened species, it has discretion to consider the economic impact of such a designation and any other

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[32] FWS Listing Program, *available at* http://endangered.fws.gov/listing/index.html#listing

[33] 16 U.S.C. § 553(e)

[34] 16 U.S.C. § 1533

[35] The factors include: "the present or threatened destruction, modification, or curtailment of the species' habitat or range; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; the inadequacy of existing regulatory mechanisms; and other natural or manmade factors affecting the species' continued existence." *See* The Endangered Species Listing Program, *available at* http://endangered.fws.gov/ESB/09/11-12/09.pdf

[36] "Endangered" means any species which is in danger of extinction throughout all or a significant portion of its range. *See* 16 U.S.C. § 1532(6)

[37] "Threatened" means any species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. *See* 16 U.S.C. § 1532(20)

[38] *See* 16 U.S.C. § 1533(a)(3)

[39] *See* 16 U.S.C. § 1533 (ESA)

relevant impact that might be caused by the designation.[22]

C. Enforcement

TVA v. Hill[23] provided the Supreme Court with its first opportunity to interpret the ESA. The Court considered whether an almost completed dam project should be halted because it would harm the snail darter fish, a newly listed endangered species. The Court declared that the language, history, and structure of the ESA clearly indicated that Congress intended the highest protection for endangered species, even over the primary missions of federal agencies. The Court found that the "plain intent of Congress in enacting this statute was to halt and reverse the trend toward species extinction, *whatever the cost*."[24] The Court further noted that the ESA's "pointed omission of the type of qualifying language previously included in endangered species legislation revealed] a conscious decision by Congress to give endangered species priority over the 'primary missions' of federal agencies."[25] Moreover, the Court found that the value of a species, any species, was "incalculable"[26] and, therefore, the ESA prohibited the completion of the dam.

This strict interpretation of the ESA was, however, short lived. After the *TVA* decision, Congress amended the ESA to create an Endangered Species Committee consisting of the heads of various federal agencies as well as a resident of each affected state.[27] This Committee has the authority to exempt a project from the ESA's critical habitat requirements if it finds that no reasonable or prudent alternative exists and that the project's benefits clearly outweigh the benefits of any alternatives.[28] Consequently, the ESA now provides administrators limited authority to equitably weigh the competing demands of the endangered species

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[22] New Mexico also has laws to protect wildlife habitats. See, e.g., Habitat Protection Act, § 17-6-1, et seq. NMSA 1978.

[23] 437 U.S. 153, 184-185 (1978).

[24] 437 U.S. at 184 (*emphasis added*).

[25] *Id.* at 185.

[26] *Id.* at 187.

[27] See 16 U.S.C. § 1536(e).

[28] This Committee is sometimes referred to as the "God Squad" because its decisions may ultimately decide whether an endangered species will survive.

against the needs of the proposed project and the affected community.

D. Central Provisions

1. Federal Agency Projects

One of the most important provisions of the ESA is Section 7.[47] This section prevents federal agencies from jeopardizing any listed species or destroying or altering any designated habitat. Section 7 requires all federal agencies to consult with the FWS or the NOAA (for marine animals) if a listed species or designated habitat may be present in the area of a proposed agency action.[48] The federal agency must consult with the FWS for any project it initiates and any project for which it might issue a license or permit to a developer.[49] The ESA utilizes strong language in this section to assure compliance, prohibiting the consideration of economic or other factors when making critical decisions under Section 7, and requiring the use of only the best and most current data and procedures.

2. Unauthorized Takings by Private Parties

Section 9[50] of the ESA applies to all persons within the United States' jurisdiction. Its significant prohibitions include: (1) the import and export of endangered species, and products made from them; (2) commerce within the United States in listed species, and products made from them; and (3) possession of unlawfully acquired endangered species. Section 9 also prohibits the "taking" of listed endangered wildlife. The definition of "taking" is quite broad because it includes any act that would "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct."[51] By statute, the "take" definition only applies to endangered species. However, the ESA grants the FWS the power to extend the "take" regulation to threatened species as well.[52] The FWS has used this discretionary provision to attach the "take" regulation to virtually

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[47] *See* 16 U.S.C. § 1536.

[48] *See* 16 U.S.C. § 1536(a)(2). Therefore, any project authorized, funded, or carried out by the federal agency requires consultation with the FWS.

[49] *See* 16 U.S.C. § 1536.

[50] 16 U.S.C. § 1532(19).

[51] 16 U.S.C. § 1538(d).

all threatened wildlife species.[54]

3. Incidental Takings and Habitat Conservation Plans[55]

Private landowners, corporations, state or local governments, or other non-federal landowners who want to conduct activities on land that might incidentally harm (i.e. "take") an endangered or threatened species, must first obtain an incidental take permit from the FWS.[56] A taking is "incidental" if it is incidental to, and not for the purpose of, the carrying out of an otherwise lawful activity.[57] An application for an incidental take permit must be accompanied by a Habitat Conservation Plan or "HCP."[58] HCPs are intended to ensure that projects adequately minimize and mitigate the effects of the authorized incidental take. Section 10 also allows for "No Surprises" assurances by the government to provide certainty to private landowners through the HCP process. "No Surprises" assurances promise the private landowner that even if unforeseen circumstances arise, the government will not require the landowner to commit additional land, water, or financial compensation, nor will the government place additional restrictions on the use of the land, water, or other natural resources beyond the level otherwise agreed to in the HCP. The government will honor these assurances so long as a permittee continues his good faith efforts to adhere to the terms and conditions of the HCP and the permit.

4. Sanctions

Those who violate provisions of the ESA are subject to the penalties provided for in Section 11.[59] This section authorizes the imposition of criminal sanctions, civil penalties, and injunctions for "takes" or other violations.[60] Civil penalties may not exceed $25,000 if the violation is done "knowingly" and may not exceed $500 if

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[54] 50 C.F.R. § 17.31(a).

[55] Please see the U.S. Fish & Wildlife Service's web page for more information on these matters. The website is located at http://endangered.fws.gov/hcp.

[56] *See* 16 U.S.C. § 1539.

[57] *See* 16 U.S.C. § 1539(a)(1)(B).

[58] *See* 16 U.S.C. § 1539(a)(2)(A).

[59] *See* 16 U.S.C. § 1540.

[60] 16 U.S.C. § 1540.

it is done without knowledge. The maximum criminal penalties are set at $100,000 for individuals and $200,000 for corporations.[61] Typical of various environmental laws, the "knowing" component of criminal and civil charges has been interpreted strictly against the violator. Courts have construed "knowingly" to mean only that the accused knowingly performed the action, not that he had any knowledge that the action affected an endangered or threatened species.[62]

E. Recent Developments

Within the past few years, the Department of the Interior has been exploring new ways to encourage private landowners to undertake voluntary conservation measures on their property to benefit threatened and endangered species.[63] These programs include the Safe Harbor and Candidate Conservation Agreement with Assurances ("CCAA")[64] policies that enlist the cooperation of private landowners in return for certain assurances from the government. The Safe Harbor policies encourage private landowners to take actions on their property to benefit listed species, in return for assurances that their conservation measures will not lead to further restriction on the use of the land if they lead to an increase in the population of the species on the property. Recent updates to these regulations are designed to provide clearer definitions and greater assurances for those private landowners who choose to cooperate through a Safe Harbor or CCAA agreement.[65]

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[61] U.S.C. § 3571.

[62] *See* United States v. Nguyen, 916 F.2d 1016 (5th Cir. 1990); United States v. St. Onge, 676 F.Supp. 1044 (D. Mont. 1988); United States v. Billie, 667 F.Supp. 1485 (S.D. Fla. 1987).

[63] Assistant Secretary Manson Announces Revised Regulations for Endangered Species Conservation Agreements on Private Lands, *available at* http://endangered.fws.gov/candidates/news_release.pdf.

[64] CCAAs are essentially the same as Safe Harbor agreements except that CCAAs apply to species *proposed* for listing, while Safe Harbor agreements apply to species already listed. There are currently 23 Safe Harbor agreements and 7 CCAAs in effect, covering 29 and 21 species respectively.

[65] Please visit the U.S. Fish & Wildlife Service web page for more information on these and other new developments. The website is located at http://endangered.fws.gov.

IV. WETLANDS – CONTROLLING USE AND ABUSE

A. An Overview

In New Mexico, there are numerous organizations that take an active interest in regulating and expanding our knowledge of local wetlands. The U.S. Army Corps of Engineers studies wetlands using the "HGM" Approach (Hydro-Geomorphology), designed to produce regional methods for assessing the physical, chemical, and biological functions of wetland areas needing protection. The U.S. Fish and Wildlife Service is responsible for wetlands classifications and research on affected, threatened, or endangered species. The New Mexico Natural Heritage Program (of the University of New Mexico Biology Department) has developed the Handbook of Wetland Communities of New Mexico to aid in the description, inventory, and assessment of New Mexico's wetland resources. The handbook provides a survey work of all major basins of New Mexico. Other organizations with an interest in New Mexico wetlands include the U.S. Forest Service, the Bureau of Land Management, and private interest groups.

B. Regulation

The primary statutory provision regulating development in Wetlands is section 404 of the Clean Water Act ("CWA").[96] The Clean Water Act[97] prohibits the discharge of pollutants[98] from discrete point sources into waters of the United States.[99] However, Congress also authorized the Army Corp of Engineers to administer a separate program under Section 404 of the CWA to address discharges of dredged or fill material into the navigable waters of the United States. Because wetlands development often involves dredge and fill operations, Section 404 has evolved into the federal government's primary tool to limit and regulate development in wetlands.

Discharges of dredged and fill material have been defined broadly so many development activities in wetlands will involve a regulated discharge. The courts

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[96] 33 U.S.C. §1344.

[97] See 33 U.S.C. §§ 1251 through 1387.

[98] "Pollutant" is defined broadly and includes dredged spoil, solid waste, incinerator residue, biological materials, rock, and sand. See 33 U.S.C. § 1362(6).

[99] Id. at § 1362(12).

generally define "discharge of dredge material" as the addition of material excavated or dredged from waters of the United States, including run-off from a dredge material disposal area. In response to the settlement of civil citizens' suits which were critical of the Corp's regulations, the Corp now adheres to a strict view of regulating dredging operations.

"Discharge of fill material" is likewise defined broadly, covering almost every activity that involves earth moving or the addition of any material into designated wetlands. Among the regulated activities are, placement of fill that is necessary for construction in a water of the United States, the building of any structure or impoundment requiring rock, sand, dirt, or other material for construction; site development fills, causeway or road fills; and many other protection or transportation devices.[1] Even the temporary stockpiling of soil from the construction of a drainage ditch or similar excavation may be a regulated discharge.

C. Permit Process

In light of the expansive definition of dredge and fill operations, every initial project assessment should determine whether the proposed development is in an area designated by the Corps as a wetland. Maps maintained by the Corps and by the Fish and Wildlife Service may be found on EPA's Wetlands website: http://www.epa.gov/owow/wetlands. Under the 1989 Interagency Federal Manual for Identifying and Delineating Jurisdictional Wetlands, three criteria must be present for an area to be considered a Jurisdiction Wetland, (1) wetland vegetation, (2) hydric soils, and (3) wetland hydrology. In certain circumstances, the presence of one of the criteria may be presumed from the presence of the other two. If the proposed development is in a designated wetland area, a section 404 permit must be obtained from the Corps of Engineers before any activity begins.

There are two types of section 404 permits - individual and general. The Corps issues individual permits for specific projects and general permits for categories of activities that involve only minimal environmental disruption. General permits may be issued on either a nationwide or on a regional basis. Consequently, if a developer is involved in multiple similar projects, he should investigate the potential applicability of general permits and, if appropriate, consider redesigning his projects so that they fall within the parameters of a general permit. If a general

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[1] 33 C.F.R. § 323.2(d)(1)

[2] 33 C.F.R. § 323.2(d)(1)(iii)(7).

permit is obtained, it will streamline the permitting process for all of the projects and result in fewer administrative obstacles for all involved parties.

D. Enforcement

The penalties for violating the Clean Water Act can be quite severe, ranging from civil monetary fines to imprisonment for criminal violations.[72] Criminal penalties are available for both negligent and knowing violations. It is not necessary that the violator know the conduct is criminal, or even that the discharge was illegal. It is only necessary that the violator knew that the discharge occurred.[73] In light of such severe penalties, anyone seeking to develop or alter land that may be regulated by the Clean Water Act should take great care to determine whether his proposed activities are regulated and authorized by the Act. However, all is not lost if a landowner or developer discovers that he has violated the Clean Water Act. If he works in good faith with the Corps of Engineers to correct the damage, the Corps has discretion to decide that no further enforcement action is necessary.[74]

E. Jurisdictional Wetlands – Recent Decisions

In *Rapanos v. United States*, 126 S.Ct. 2208 (2006) (consolidated with *Carabell v. U.S. Army Corps of Engineers*, 391 F.3d 704 (6th Cir. 2004)), the Supreme Court, by a 4:4:1 plurality, remanded to the Sixth Circuit the issue of whether the U.S. Army Corps of Engineers (the Corps) exceeded its statutory authority under the CWA by requiring property owners to acquire permits before dredging and filling certain wetlands. The case presented the Court with the opportunity to determine whether the wetlands at issue were subject to the United States' jurisdiction under the CWA. The Court's decision advanced conflicting tests for determining whether wetlands are protected by federal law. As explained in detail below, the Ninth and Seventh Circuits have held one test to be the controlling standard, while the First Circuit has held that if either of the two proposed tests is met, the federal government has jurisdiction over the wetland at issue.

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[72] See 33 U.S.C. § 1319.

[73] See Weitzenhoff v. United States, 35 F.3d 1275 (9th Cir. 1994).

[74] See 33 C.F.R. 326.3(c)(1).

Justice Scalia's 4-4-1 plurality decision in *Rapanos* took a narrow interpretation of "waters of the United States," and would remove many wetlands from the Corps' CWA jurisdiction by requiring a continuous surface water connection. Justice Scalia proposed a two-part test such that wetlands would be covered by the CWA where (1) "the adjacent channel contains a 'wate[r] of the United States,'" and (2) "the wetland has a continuous surface connection with that water, making it difficult to determine where the 'water' ends and the 'wetland' begins." *Id.* at 2227.

Justice Kennedy specifically rejected Scalia's test in his concurrence. Kennedy found the plurality's interpretation of "waters of the United States," as inconsistent with the language and purpose of the CWA, and advanced a test that would require a "significant nexus" between wetlands and navigable waters on a case-by-case basis. *Id.* at 2248 (Kennedy, J., concurring). Under this test:

> Wetlands possess the requisite nexus, and thus come within the statutory phrase "navigable waters," if the wetlands, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as "navigable."

The Supreme Court's decision in *Rapanos* both explicitly and implicitly left the door open for legislative and regulatory changes on this issue. In fact, Justice Breyer's dissent called on the Corps to "write new regulations, and speedily so." *Id.* at 2255 (Stevens, J., dissenting) (citations omitted).

The Ninth Circuit has interpreted Justice Kennedy's plurality opinion in *Rapanos* as the controlling law in this area. In *Northern California River Watch v. City of Healdsburg*, 457 F.3d 1023 (9th Cir. 2006), the Ninth Circuit held that a city must obtain an NPDES permit to discharge sewage into a rock quarry pit filled with water from an aquifer adjacent to the Russian River. In doing so the court held, with limited analysis, that Justice Kennedy's "significant nexus" test is the standard by which to determine whether particular wetlands constitute "waters of the United States" subject to the CWA.

The Seventh Circuit followed suit in *United States v. Gerke Excavating, Inc.*, 464 F.3d 723 (7th Cir. 2006) by holding that Justice Kennedy's concurrence in *Rapanos* provides the legal standard for CWA wetlands jurisdiction. The court

remanded the case to the district court with instructions to determine whether the Corps had jurisdiction over the wetland in question under Justice Kennedy's "significant nexus" test.

The First Circuit departed from the analysis of the Ninth and Seventh Circuits and has held that the federal government can establish CWA jurisdiction if it can meet either of the two standards set forth in the *Rapanos* decision. *See United States v. Johnson*, 467 F.3d 56 (1st Cir. 2006).

V. ACCOMMODATING EXISTING SITE CONTAMINATION IN DESIGN AND CONSTRUCTION

A. Comfort letters

The purpose of comfort letters is to provide prospective purchasers and others with the best, current information about the EPA's interest, or lack thereof, in a given site. These letters summarize data available to the EPA regarding a site and, importantly, summarize the federal government's past actions and future expectations with respect to response actions at the site. The EPA will not issue a comfort letter for any property unless there is a realistic perception or a probability of a prospective new owner incurring CERCLA liability. The EPA policy, which may be found on the EPA website, sets out four types of sample comfort status letters:

a. A "no previous federal Superfund interest" letter advises party that there is no evidence of past Superfund interest or involvement with the site (in other words, the site is not in the CERCLIS database).

b. A "no current federal Superfund interest" may advise a prospective purchaser that this site has been deleted from CERCLIS or from the National Priorities List.

c. A "federal interest" letter advises the prospective purchaser that the EPA is responding, or plans to respond, to contamination at a site.

d. A "State Action" letter indicates that the State has primary responsibility for any activities at this site.

EPA's model comfort letter is attached to this paper as Exhibit A.

B. Prospective Purchaser Agreements ("PPAs")

In contrast to a comfort letter, a PPA provides actual resolution or liquidation of any legal liability that the prospective purchaser might incur. EPA issued its guidance on agreements with prospective purchasers of contaminated property on May 24, 1995, which states that PPAs are available only for sites where there has been, or where there realistically will be, a CERCLA response action. This standard is more restrictive than that which governs the issuance of comfort letters. The essence of a PPA is a covenant not to sue the new owner for pre-existing contamination, which is generally granted in exchange for appropriate consideration. The covenant not to sue also qualifies pursuant to section 113 (f)(2) of CERCLA, to protect the new owner from possible contribution actions by other PRPs.

The EPA guidance states that in consideration of granting the covenant not to sue, the EPA should receive a substantial benefit either in the form of a clean-up, or an indirect public benefit in combination with a reduced direct benefit to EPA. Prior versions of the guidance restricted the consideration to direct benefits of cash or clean-up work. However, the current guidance recognizes the considerable indirect benefit that can be realized from Brownfields redevelopment, including the creation or retention of jobs, the development of abandoned or blighted property, the creation of conservation or recreation areas, or the improvement of public transportation or infrastructure.

A draft PPA is attached to this paper as Exhibit B.

VI. STORMWATER MANAGEMENT [70]

Stormwater[71] runoff is the most common cause of water pollution.[72]

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[70] The information in this section is compiled from the Construction Industry Compliance Assistance Center, funded by the U.S. Environmental Protection Agency. See the website at cicacenter.org for additional information.

[71] "The official definition of 'stormwater' is 'runoff, surface runoff, street wash waters related to street cleaning or maintenance, infiltration and drainage related to storm events or snow melt.'" National Pollutant Discharge Elimination System: Permit Application Regulations for Storm Water Discharges, 55 Fed. Reg. 47990 (Nov. 16, 1990)(codified at 40 C.F.R. §§ 122-124).

[72] EPA, *Stormwater Outreach Materials and Reference Document*, (last updated Aug. 2006), http://cfpub.epa.gov/npdes/stormwater/monitor.cfm. "Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces [...] prevent stormwater from naturally soaking into the ground." EPA, A GUIDE TO THE STORM WATER GUIDELINES, UNDERSTANDING STORMWATER, EPA pamphlet EPA 833-B-03-002 at CRS-1 (Jan. 2003). The

Although many believe that stormwater is relatively clean, "discharge—from rainfall and snow melt—carries with it large amounts of organic and toxic pollutants that can harm water quality, including oil and grease, heavy metals, pesticides, soil, and sediment."[71] The rain and snowmelt, traditionally nonpoint sources, carry these discharges either into storm sewer systems, which carry the discharge untreated into waterbodies, or directly into waterbodies.[72]

The EPA has recognized that "nonpoint source pollution continues to be, and is increasingly recognized as, the largest remaining threat to water quality and source of water quality impairments in the nation."[73] Thus, as traditional sources of water pollution have become more regulated and better controlled, attention has shifted to other sources of pollution, such as stormwater, affecting water quality standards (WQSs). In fact, the EPA has placed stormwater regulation compliance on its "national enforcement priorities" list for water.[74] Since stormwater comprises a large source of pollution, Congress, through the Water Quality Act of 1987, directed the EPA "to implement a specific permit program for stormwater discharges from industrial sources and municipalities."[75]

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problems associated with stormwater runoff are directly related to the development in urban and urbanizing areas, along with the pollutants attributable to humans. EPA, *Menu of BMPs: background* (last updated June 2, 2006), http://cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_background.cfm

[71] Claudia Copeland, *Stormwater Permits: Status of EPA's Regulatory Program*, CRS REPORT FOR CONGRESS, 97-290 ENR (updated Aug. 25, 2005). Pollutants can: 1) destroy aquatic habitats, 2) remove oxygen from water which kill fish and aquatic organisms, 3) create health hazards and close beaches, 4) suffocate and choke animals, 5) affect drinking water, and 6) increase treatment expenses. AFTER THE STORM, *supra* note 53.

[72] AFTER THE STORM, *supra* note 53.

[73] Nonpoint Source Program and Grants Guidelines for States and Territories, 65 Fed. Reg. 66,656 (Oct. 23, 2000).

[74] EPA, *CWA National Enforcement Priorities* (last updated Mar. 23, 2006), http://www.epa.gov/compliance/civil/cwa/cwaenfpriority.html

[75] Copeland, *supra*, note 54, at CRS-1-2. Water Quality Act of 1987 ("Water Quality Act"), Pub. L. No. 100-4, § 405, 101 Stat. 7 (1987).

The EPA sought to implement Congress' permit mandate[83] in two phases, announcing the rules and regulations for Phase I in 1990 – 21 months after the statutory deadline.[84] Phase I applied to large dischargers including: 1) industrial activities,[85] 2) municipal storm systems serving at least 100,000 people; and 3) construction projects disturbing more than five acres of land.[86] "123,000 industrial facilities (twice the number of industrial sources subject to the base NPDES program) and 220 municipalities and counties were covered by the" Phase I rules.[87] Phase II of the program, implemented in 1999, several years after Congress' mandate under the Water Quality Act,[88] applies to: 1) storm systems serving less than 100,000 people, 2) commercial operations; and 3) small construction projects disturbing one to five acres of land.[89] The EPA estimated that Phase II "would make approximately 3,000 more river miles safe for boating annually and protect up to 500,000 people a year from illness due to swimming in contaminated waters."[90]

Permits are issued under the NPDES system. Thus, states generally issue the permits unless the state has not been authorized to do so by the EPA. See Proper NPDES Permitting, *infra*, Part B for further discussion of NPDES permits.

[83] See Water Quality Act, Pub. L. No. 100-4, § 405.

[84] In 1995, the EPA estimated "that about 100,000 facilities nationwide discharge storm water associated with industrial activity (not including oil and gas exportation and production operations) as described under phase I." Final National Pollutant Discharge Elimination System Storm Water Multi-Sector General Permit for Industrial Activities, 60 Fed. Reg. 50,807 (Sept. 29, 1995) (hereinafter "Industrial Permit.")

[85] Copeland, *supra* note 54, at CRS-2.

[86] *Id.*

[87] The rules for Phase II should have been issued in 1992. The EPA, however, received a one-year extension under Pub. L. 102-580. Finally, a judicial order was issued requiring the EPA to develop the final rules for Phase II by March 1, 1999. *Natural Resources Defense Council, Inc. v. Browner and EPA*, Civ. No. 95-634 PLF (D.D.C. filed Apr. 7, 1995).

[88] See Copeland, *supra* note 54, at CRS-2, CRS-4.

[89] *Id.* at CRS-4. Waiver from Phase II coverage is available for both cities with a population of less than 10,000 persons and construction activities if the discharges will not cause water quality impairment. *Id.* Critics of the Phase II rules believe the cost for small cities and construction activities, estimated at $297 million annually and $505 million respectively, is too great. *Id.* at CRS-5.

Interestingly, a NPDES permit was not required under the Water Quality Act[87] for "storm water discharges from oil and gas exploration, production, processing, or treatment operation, or transmission facilities."[88] This exception, the oil and gas industry noted, would still subject construction activities associated with oil and gas to permit requirements.[89] In response, the EPA deferred Phase II requirements for oil and gas construction activities. The EPA's ongoing analysis of oil and gas construction activities became unnecessary following Congress' passage of the Energy Policy Act of 2005.[90]

The Act added a new paragraph to the Clean Water Act[91] which "defined the term 'oil and gas exploration, production, processing, or treatment, or transmission facilities' to mean 'all field activities or operations associated with exploration, production, processing, or treatment operations, or transmission facilities, *including activities necessary to prepare a site for drilling and for the movement and placement of drilling equipment, whether or not such field activities or operations may be considered to be construction activities*.'"[92] Thus, under the new definition, and as the EPA's final rule states, any activities or operations associated with oil and gas exploration, production, processing, or treatment operation or transmission facilities are exempt from NPDES permit requirements.[93] The final rule does

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[87] Clean Water Act § 402(l)(2).

[88] EPA, *Final Rule: Amendments to the Storm Water Regulations for Discharges Associated with Oil and Gas Construction Activities*, available at http://www.oogc.org/PDFs/final_oil_gas_factsheet.pdf#search=%22%22changes%20to%20the%20NPDES%20regulations%20promulgated%20by%20this%20rule%22%22 (last visited Aug. 24, 2006) (hereinafter "Oil and Gas Amendments"). Although a few limited circumstances associated with oil and gas will require a permit. Namely, when any activities that would "result in a discharge of reportable quantity release or that contribute pollutants, into a violation of a water quality standard are still subject to permit coverage." *id.*

[89] The industry claimed this would have a "significant economic impact on the industry" because 30,000 sites annually would need to obtain a permit. *id.*

[90] Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005).

[91] § 323 of the Energy Policy Act added § 402 to § 502 of the Clean Water Act.

[92] Oil and Gas Amendments, *supra* note 68 (emphasis added).

[93] Amendments to the National Pollutant Discharge Elimination System (NPDES) Regulations for Storm Water Discharges Associated With Oil and Gas Exploration, Production, Processing, or Treatment Operations or Transmission Facilities, 71 Fed. Reg. 33,628 (June 12, 2006) (to be codified at 40 C.F.R. pt. 122). In the discussion behind the rule, the EPA supports the rule because "there could be administrative delays in the permitting process for oil and gas construction sites which could result in substantial economic impacts, particularly in the form of lost production

encourage "voluntary application of best management practices for oil and gas field activities and operations to minimize the discharge of pollutants in storm water runoff and protect water quality."[58]

Those requiring a permit under Phase I or II must, under the terms of the permit, implement pollution prevention plans. Cities requiring permits must develop and enforce a stormwater management program that addresses issues "such as public education, eliminating illicit connections to storm sewers, good housekeeping of municipal operations, and control of erosion and sedimentation from construction sites."[59] Industrial facilities covered under the permit plan must develop a stormwater pollution prevention plan. The prevention plans are intended to facilitate identification of pollution sources and to implement appropriate measures to control or prevent discharges in stormwater.[60] The EPA believes that such plans are the most cost-effective and environmentally sound way to control discharges in stormwater runoff.[61]

A. Where Do You Get a Permit?

If your construction project is located in one of the following states or territories, you must get a federal stormwater permit from EPA:

- Alaska
- American Samoa
- Guam
- Idaho
- New Mexico
- Northern Mariana Islands
- Puerto Rico
- Trust Territories

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revenues, that were not considered in the original economic analysis for the 1999 Phase II rulemaking." *Id.* at 33,130.

[58] *Id.* at 33,628.

[59] Copeland, *supra* note 54, at CRS-3. "Most cities use best management practices (BMPs) to manage stormwater, which include nonstructural measures to minimize contaminants getting into stormwater (e.g., street sweeping) and structural practices such as detention ponds to separate contaminants from stormwater." *Id.* at CRS-5.

[60] Industrial Permits, 60 Fed. Reg. at 50,814. "The development of a plan involves "four steps: 1) Formation of a team of qualified plant personnel who will be responsible for preparing the plan and assisting the plant manager in its implementation; 2) assessment of potential storm water pollution sources; 3) selection and implementation of appropriate management practices and controls; and 4) periodic evaluation of the effectiveness of the plan to prevent storm water contamination." *Id.* at 50,814-15.

[61] *Id.* at 50,815.

- Massachusetts
- New Hampshire
- Tribal Lands (most but not all)
- Washington, D.C

Additionally, there are several other instances where the CGP applies, including construction related to oil and gas activities in Texas; oil and gas and certain agricultural and silvicultural activities in Oklahoma; and construction of federal facilities in Colorado, Delaware, Vermont, and Washington. Refer to Attachment A of the stormwater checklist in Part II of the CICA guide for more details.

For coverage under the federal CGP, you can submit your NOI and NOT to http://cfpub.epa.gov/npdes/stormwater/enoi.cfm or to the following addresses.

Regular U.S. Mail Delivery	Overnight Express Mail Delivery
Stormwater Notice of Intent	Stormwater Notice of Intent
U.S. EPA - Ariel Rios Building	U.S. EPA - East Building, Room 7420
Mail Code 4203M	U.S. EPA
U.S. EPA	1201 Constitution Ave., NW
1200 Pennsylvania Ave., NW	Washington, DC 20004
Washington, DC 20460	

If your construction project is in one of the other 45 states or the U.S. Virgin Islands, you generally must get a stormwater permit from the state or territory (note that for certain activities in specific states, such as oil and gas construction activities in Texas, your project may require a federal permit). Construction projects in states authorized to administer the stormwater program may be subject to requirements that are different from the CGP requirements. **In all cases, check with your EPA region or state to determine the stormwater requirements that apply. You can find information on state-specific stormwater permit requirements and contact information for state environmental departments at the Construction Industry Compliance Assistance Center (http://www.cicacenter.org).**

B. What Questions DO you Need to Answer Before Starting Your Construction Project?

You can use the questions in Section II of Part I of the CICA guide to start a discussion among all parties involved in the construction project and to assign tasks to ensure all environmental requirements are met. Each question has a space next to it to designate who will take the lead on each task. Note that designating a responsible party does not absolve you of your own obligation to meet environmental requirements or liability for failing to meet these requirements.

C. Where Can You Get Additional Information?

Many tools are available to assist you with the stormwater permit requirements, including the following.

- The Stormwater Self-Audit Checklist in Part II of the CICA guide:

- The Construction Industry Compliance Assistance Center provides plain language explanations of environmental rules for the construction industry, including tools to identify state-specific requirements, permits, and contacts: http://www.cicacenter.org/stormwater.html:

- The National Environmental Compliance Assistance Clearinghouse contains a search engine to help you find compliance assistance tools, contacts, and EPA-sponsored programs: http://www.epa.gov/clearinghouse/

- The Office of Wastewater Management, NPDES Stormwater Program provides information about the NPDES stormwater program. http://www.epa.gov/npdes/stormwater/

- The NPDES Construction Site Stormwater Runoff Control web page provides factsheets on a variety of stormwater best management practices (BMPs): http://cfpub.epa.gov/npdes/stormwater/menu-bmps/con_site.cfm:

- Does Your Construction Site Need a Stormwater Permit? A Construction Site Operator's Guide to EPA's Stormwater Permit Program is a brochure that provides construction companies with a brief overview of EPA's CGP and its requirements: http://www.epa.gov/npdes/pubs/sw_cgp_brochure.pdf:

- Resource List for Stormwater Management Programs lists resources to help stormwater program managers start developing or improve their stormwater programs: http://www.epa.gov/npdes/pubs/sw_resource_list.pdf;

- The Stormwater Manager's Resource Center contains a series of factsheets for stormwater BMPs that include information on soil type, slope, and cost: http://www.stormwatercenter.net/; and

- EPA's "Where you live" page contains links to state environmental agencies: http://www.epa.gov/epahome/whereyoulive.htm.

LIST OF QUESTIONS FOR OWNERS AND CONTRACTORS

This section contains a list of questions to help owners and contractors assign who is responsible for ensuring compliance with the applicable environmental regulations discussed in the CICA guide. You should make these assignments prior to beginning any construction activity. If you are unfamiliar with these environmental regulations, you should reference the corresponding detailed section (Sections III through XI of Part I) of the guide for more information. These sections contain detailed information and helpful resource links related to each regulation. Please note that this section does not include checklists for NEPA and NHPA. For more information on these regulations, go to http://eec.ch.doe.gov/nepa/nepanet.htm and http://www.achp.gov.

Getting a Permit	**Assigned To**
A.1 Who will determine if you need a stormwater permit? (A permit is generally required when at least one acre of land is disturbed.)	_____
A.2. Who will find out what agency issues the stormwater permit for your location (i.e., U.S. EPA, state, or local government) and get the permit? To determine your permitting authority, go to the following web site: http://cfpub.epa.gov/npdes/stormwater/authorizationstatus.cfm. If your construction activity occurs in an area where the state issues permits, contact your state for further information about applicable requirements	_____

The following questions specifically apply to the Federal Construction General Permit

A.3. Who will submit the Notice of Intent (NOI) before the start of the construction project and submit the Notice of Termination (NOT) to EPA when the construction project is complete? _____ _____

A.4. Who will comply with the Endangered Species Act requirements? _____ _____

A.5. Who will determine if the receiving waters are covered under a Total Maximum Daily Load (TMDL) requirement? _____ _____

A.6. Who will develop the stormwater pollution prevention plan (SWPPP) includes selection of appropriate BMPs? _____ _____

Meeting Permit Requirements

A.7. Who will perform and document the inspections? _____ _____

A.8. How often will inspections be performed? _____ _____

A.9. Who will install and maintain Best Management Practices (BMPs) and stormwater controls? _____ _____

A.10. Who will notify site personnel of the permit requirements (e.g., ensuring controls are in place and telling the recordkeeper of any site changes)? _____ _____

A.11. Who will modify the SWPPP during the construction project (including updating records and documenting inspection results)? _____ _____

A.12 Who will update the site map? _____ _____

A.13. Who will be the recordkeeper? _____ _____

APPENDIX D: POST-CONSTRUCTION STORM WATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT PROGRAM

NEW DEVELOPMENT/REDEVELOPMENT PROCESS
for
STORMWATER POLLUTION PREVENTION AT UNM

Purpose

The University of New Mexico (UNM) endeavors to be a good neighbor to our community and the natural environment. To that end, UNM strives for practical and cost-effective solutions to minimize impacts to our community and the environment.

Consistent with these goals, UNM continues to design and plan our campus to minimize pollution to storm water by incorporating storm water pollution prevention (SWP2) practices when the area of disturbance for new development and significant redevelopment exceeds one acre. The process for this is already outlined in UNM's existing Storm Water Management Program section 6.2.1 - NEW DEVELOPMENT AND GENERIC CONSTRUCTION REDEVELOPMENT.

UNM's SWP2 process for the areas of new development and significant redevelopment on the UNM campus is ongoing and evolving. As desired by all involved, including the affected programs, it not cast-in-stone and will be periodically modified in order to allow future improvements.

CERTIFICATION OF IMPLEMENTATION

I am an authorized representative as described in Appendix G, Subsection H of the NPDES General Permit.

I certify that the University of New Mexico (UNM) will continue to:
1. Implement SWP2 principles in master planning;
2. Adopt the "National Pollutant Discharge Elimination System Manual: Storm Water Management Guidelines for Construction and Industrial Activities" November 2012 (by NMDOT, CABQ & ABCWUA) as a guidance document; and,
3. Incorporate standards from this guidance document and requirements from UNM's NPDES Permit # NM8[illegible] in UNM's master planning, plan review and approval processes.

To continue to improve the efficiency & effectiveness of this process, UNM anticipates changes to it as needed in the future. All such changes will be compliant with NPDES regulations and consistent with SWP2 goals.

I certify under penalty of law that this program and attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my

MEMORANDUM

DATE: November 28, 2006

TO: David W. Harris, Acting UNM President

FROM: Vernon Hershberger, Environmental Health Manager

SUBJECT: **Signature on EPA Storm Water Permit Required Certification**

The EPA issued a National Pollutant Discharge Elimination System (NPDES) Permit jointly to UNM, AMAFCA, City of Albuquerque and NMDOT for the combined entities' municipal separate storm sewer systems (MS4), as is required by the Clean Water Act. Via NPDES Permit #NM0[illegible]61, the EPA requires UNM to certify implementation of the New *Development and Significant Redevelopment* Program for storm water pollution prevention (SWP2) practices at sites where soil surface disturbance exceeds one acre. Assuming sufficient funding and staff, this program will continue to be implemented as part of UNM's SWP2 effort.

It now needs only your signature where tabbed on the certification sheet. **Please sign this by November 30, 2006, if possible.**

University Counsel has already reviewed this prior to your review. When finished, please contact me at 7-6756, or at 266-8343 ASAP. Someone from SRS (formerly RSHEA) will then promptly pick it up for copying & distribution. Our goal is document delivery to the EPA by December 1, 2006 via overnight mail.

Thank you for your help on this important project.

Cc: Donna K. Smith, Director, Safety & Risk Services (SRS)

2006 UNM Athletics Clean Up Expenses that Protect Storm Water

Football Games (five games)	$1,000.00
Neighborhood payment (monthly)	$1,800.00
State Basketball (two nights)	$1,300.00
Pow Wow (two days)	$1,000.00
Men & Women Basketball Games	$2,500.00
Daily clean up (student boot camp)	$2,250.00
Shop areas (daily clean up)	$600.00
Isotopes clean up (their expense)	$5,000.00
	$25,480.00

Trash pick up

Four guys for one hour per day, five times a week for 45 weeks $9,000.00

Sweep curbs and sidewalks

Four guys for three hours per day, twice a week for 45 week $3,780.00

Shipment Receipt

(Keep this for your records.)

Transaction Date: 31 Nov 2006

Address Information

Ship To:	Shipper:	Ship From:
U.S. EPA Region 6	UNM	UNM
Ms. Wanda L. Smedley	Roselle Mercier	Roselle Mercier
Water Enforcement Branch (6EN-WC)	505-277-1661	505-277-1661
1445 Ross Avenue	1801 Tucker NE Bldg. 232	1801 Tucker NE Bldg. 232
DALLAS TX 75202-2733	308	308
	RSHE4	RSHE4
	Albuquerque NM 87131	Albuquerque NM 87131

Shipment Information

Service:	UPS Next Day Air Saver
*Guaranteed by	3:00 PM Fri 1 Dec 2006

Shipping: **20.85

Package Information

Package 1 of 1

Tracking Number:	1Z0450WE1[illegible]9254[illegible]
Package Type:	Your Packaging
Actual Weight:	6 lbs
Billable Weight:	10 lbs
Reference # 1:	Stormwater Certification

Billing Information

Bill Shipping Charges to: Shipper's Account 0450WE

Total: **All Shipping Charges in USD** **20.85

Note: Total shown is for reference only. It does not include applicable taxes.

* For delivery and guarantee information, see the UPS Service Guide. To speak to a customer service representative, call 1-800-PICK-UPS for domestic services and 1-800-782-7892 for international services.

** Rate includes a fuel surcharge.

Responsibility for Loss or Damage

Unless a greater value is recorded in the declared value field as appropriate for the UPS shipping system used, the shipper agrees that the released value of each package covered by this receipt is no greater than $100, which is a reasonable value under the circumstances surrounding the transportation. If additional protection is desired, a shipper may increase UPS's limit of liability by declaring a higher value and paying an additional charge. UPS does not accept for transportation and shipper's requesting service through the Internet are prohibited from shipping packages with a value of more than $50,000. The maximum liability per package assumed by UPS shall not exceed $50,000, regardless of value in excess of the maximum. Claims not made within nine months after delivery of the package (sixty days for international shipments), or in the case of failure to make delivery, nine months after a reasonable time for delivery has elapsed (sixty days for international shipments), shall be deemed waived. The entry of a C.O.D. amount is not a declaration of value for carriage purposes. All checks or other negotiable instruments tendered in payment of C.O.D. [illegible] accepted by UPS at shipper's risk. UPS shall not be liable for any special, incidental, or consequential damages. All shipments are subject to the terms and conditions contained in the UPS Tariff and the UPS Terms and Conditions of Service, which can be found at www.ups.com.

CONTRACT REVIEW FORM
Last Revised 12/08/06

[illegible] Contract Review Officers [illegible] the extent [illegible] understand the proposed contract [illegible] provided [illegible] information [illegible] Contract Review Form [illegible]

Certificate of University Employee Initiating Contract

Parties to the Contract: *U.S. Environmental Protection Agency (EPA) and LNM*

Date: *November 28, 2006*

Short Description: *LNM certification or implementation of storm water pollution prevention (SWPP) processes for areas of new development and significant redevelopment on campus*

Contract Term: *Indefinite* Amount: **None immediately. However, SRS needs additional staff to adequately supervise the EPA-required work on this and other storm water permit related environmental requirements.**

Except as indicated in any attached memorandum I have read the contract entirely, understand all its provisions, believe that it meets program needs and LNM mission requirements, believe that it represents a good deal for the University, and take responsibility for complying with the terms of the contract. The document is internally consistent and clear. I am also satisfied with the description of the University's obligations and with the description of any goods or services to be provided by or to the University. Any risk [illegible] have been [illegible] in a memorandum [illegible] not attached. To the extent the contract requires [illegible] funds are available [illegible] the University [illegible] the funds [illegible] attached approval from [illegible]

Compliance with the contract will require the following departments or positions:

FRE/OCP & PPD – To continue to plan for & implement SWPP processes at all construction and demolition projects with greater than 1-acre of surface soil disturbance.

SRS (formerly RSHEA) – To continue to assist & monitor SWPP compliance processes at such construction and demolition projects

11/28/06 — Vernon Fischberger — Environmental Health Manager
Date — Signature Typed Name Title

Dean (Academic) or Director (Staff) Certificate (if above party is not a Dean or Director)

I concur with the above certification

[illegible] — Director SRS
Date — Signature Typed Name Title

Contract Review Officer Review

[illegible] the contract and it does not contain any legally prohibited provisions, includes all legally or administratively required provisions, is basically consistent and clear, and is not otherwise unconscionable or legally or administratively defective. I have indicated below any other review necessary prior to execution of this contract.

[illegible] — Director Sponsored Programs Contract Contract
Date — Signature Typed Name Title

[illegible] Recommend Additional Review (see page 2)

APPENDIX E: EXECUTIVE ORDER 2006-001

State of New Mexico

Office of the Governor

Bill Richardson
Governor

EXECUTIVE ORDER 2006-001

STATE OF NEW MEXICO ENERGY EFFICIENT GREEN BUILDING STANDARDS FOR STATE BUILDINGS

WHEREAS, the State of New Mexico is committed to improving the health of its employees and its citizens, increasing the production and use of clean energy sources, reducing waste, conserving water, and reducing greenhouse gas emissions, and desires to empower sustainable economic development;

WHEREAS, the Federal Government through programs fostered within many of its key agencies, numerous State governments as well as municipalities across the U.S. have adopted high performance green building principles through the incorporation of the U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) rating system into their building services;

WHEREAS, a recent study by the Lawrence Berkley National Laboratory completed the most definitive cost-benefit analysis of green buildings ever conducted and concluded that the financial benefits of green design are between $50 and $70 per square foot in a LEED building, more than 10 times the additional cost associated with building green. Additionally, the large positive impact on employee productivity and health gains suggests that green building has a cost-effective impact beyond just the utility bill savings;

WHEREAS, studies have indicated that student attendance and performance is higher in green school buildings;

WHEREAS, recognizing that a building's initial construction costs represents only 20-30 percent of the building's entire costs over its 30 to 40 year life, emphasis should be placed on the "life cycle costs" of a public building rather than solely on its initial capital costs; and

WHEREAS, the construction industry in the State of New Mexico represents a significant portion of our economy and a significant portion of the building industry is represented by small business and an increase in sustainable building practices will encourage and promote new and innovative small business development throughout the State.

NOW, THEREFORE, I, Bill Richardson, Governor of the State of New Mexico, declare that the state adopt specific standards to implement and facilitate the use of high performance energy efficient green building practices for all state-funded existing and new buildings throughout the State of New Mexico.

IT IS THEREFORE ORDERED that all Executive Branch state agencies, including the Higher Education Department, adopt the U.S. Green Building Council's LEED™ rating system consistent with all applicable laws to achieve the following:

- New construction of public buildings in excess of 15,000 square feet and/or using over 50 kW peak electrical demand shall build to and achieve a minimum rating of "LEED™ Silver." In achieving its LEED™ rating, the project must achieve a minimum delivered energy performance standard of one half the U.S. energy consumption for that building type as defined by the U.S. Department of Energy.
- New construction and renovation projects of public buildings between 5,000-15,000 square feet in size shall achieve a minimum delivered energy performance standard of one half the U.S. energy consumption for that building type as defined by the U.S. Department of Energy.
- Renovations of public buildings in excess of 15,000 square feet and/or using over 50 kW peak electrical demand and comprising upgrades or replacement of two of the three major systems (HVAC, lighting, and plumbing), shall achieve a minimum rating of "LEED Silver" and a minimum delivered energy performance standard of one half the U.S. energy consumption for that building type as defined by the U.S. Department of Energy.
- All other new construction, renovations, repairs, and replacements of state buildings shall employ cost-effective, energy-efficient, green building practices to the maximum extent possible, and

IT IS FURTHER ORDERED, that the General Services Department, in coordination with the Energy, Minerals and Natural Resources Department, **the Construction Industries Division**, and the New Mexico Chapter of the U.S. Green Building Council, shall develop criteria and a workable process for implementing this system; and

IT IS FURTHER ORDERED, that the General Services Department encourage private-sector building owners that lease to State agencies to comply with the same energy-efficiency performance standards required of State agencies in this Executive Order by offering preference points as determined by the Evaluation Committee for each lease RFP conducted under jurisdiction of the General Services Department; and

IT IS FURTHER ORDERED, that the Energy, Minerals, and Natural Resources Department (EMNRD) convene a "Public Schools Clean Energy Task Force" that shall be advisory in nature and shall make recommendations to implement aggressive energy efficiency measures in all existing school buildings and in the construction of all new schools and school renovations, including adopting the same energy efficiency standards established for executive branch agencies in this order. The Task Force shall also address the public schools' implementation of Executive Order 05-049, *Requiring the Increased Use of Renewable Fuels in New Mexico State Government*. The Task Force shall consist of representatives from EMNRD, Public Education Department, New Mexico Coalition of School Administrators, New Mexico School Boards Association, Public School Facilities Authority, Public Schools Capitol Outlay Task Force, and other members as appropriate. The Task Force shall report to the Governor by August 1, 2006 on its findings and recommendations; and

IT IS FURTHER ORDERED, that the Local Government Division of the Department of Finance and Administration, evaluate and develop recommendations to ensure that the siting of public buildings, including schools, minimizes transportation-related energy usage; and

IT IS FURTHER ORDERED, that the Construction Industries Division (CID) and the Construction Industries Commission (CIC) pursue updating residential and commercial building codes to promote and encourage consumers to develop state-of-the-art cost-effective energy efficient buildings and, in cooperation with EMNRD, engage the active support and participation from the CID and CIC on green building outreach, training and technical assistance efforts; and

IT IS FURTHER ORDERED, that all State agencies are encouraged to work cooperatively with one another to achieve the goals outlined in this executive order.

THIS ORDER supersedes any other previous orders, proclamations, or directives in conflict. This Executive Order shall take effect immediately and shall remain in effect until such time as the Governor rescinds it.

ATTEST:

REBECCA VIGIL-GIRON
SECRETARY OF STATE

DONE AT THE EXECUTIVE OFFICE THIS 16TH DAY OF JANUARY, 2006

WITNESS MY HAND AND THE GREAT SEAL OF THE STATE OF NEW MEXICO

BILL RICHARDSON
GOVERNOR

APPENDIX F: INTEGRATED PEST MANAGEMENT PROGRAM AND PESTICIDE AND HERBICIDE PROGRAM

NPDES implementation certification

For

UNM's Pesticide, Herbicide and Fertilizer Management Program

[illegible]

Environmental Services - Grounds and Landscaping
Storm Water Management Program

[illegible]

[illegible]

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]

Fertilizer

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]

[illegible]

1. [illegible]
2. [illegible]

[illegible]

1. [illegible]
2. [illegible]

Physical Plant Department Pest Management Plan

[illegible]

[illegible] Pesticide, Herbicide and Fertilizer Management Program

[illegible]

[illegible]

[illegible]

__________________________ ______________

[illegible] Date

[illegible]

OPERATOR EDUCATION & TRAINING PROGRAMS
for
STORMWATER POLLUTION PREVENTION [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

I. CONSTRUCTION SITES

[illegible]

A. Construction Project Inspector

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

- [illegible]
  - [illegible]
  - [illegible]
    [illegible]

[illegible]

The University of New Mexico
Physical Plant Department
Albuquerque, NM 87131
(505) 277-2421

The Association of Higher Education Facilities Officers

The Development and Implementation of Integrated Pest Management Programs at the University of New Mexico

R. Gary Smith, Ph.D., Integrated Pest Management Specialist
University of New Mexico Physical Plant Department
Environmental Services

Presented to:
The Association of Higher Education Facilities Officers
83rd Educational Conference and Annual Meeting
Salt Lake City, Utah, July 21-23, 1996

Introduction

In September, 1993, the Clinton Administration issued a reform package on the nation's pesticide and food safety laws. Among these reforms was the vision to establish a national goal for use of Integrated Pest Management (IPM) in 75% of all managed acres by 2,000 AD. The Clinton administration gives the Cooperative Extension Service the lead role in developing guidelines and implementing IPM programs to achieve that vision. The National Extension IPM program was thus born and has since expanded that vision to 'include forestland, rangeland, gardens, and landscaped acres in urban and rural sites'. Implementing an IPM philosophy in these areas will meet that vision by offering a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks.

Since the term 'Urban Integrated Pest Management' was introduced more than 15 years ago, pest managers have struggled with the differences between Agricultural IPM and Urban IPM, in part because there are few Urban IPM programs in place like the one at the University of New Mexico (UNM) to test the theories behind sound integrated pest management. While the objective in agricultural IPM is to manage pests below economically damaging levels, the objective in the urban environment is largely based on emotional responses. Compounding the problem is a lack of detailed information regarding the biology and ecology of the major pests of ornamental plants. Aesthetic threshold damage levels are the criteria for landscape ornamentals; and to provide for an essentially pest-free living space for indoor pests in other words, there is 'zero tolerance' of some indoor pests. Programs similar to the one at UNM are needed to test the theories of basic IPM and provide a framework for other facility managers. All IPM programs require the efficient and economical use of some form of pesticides, although pesticide use is kept to a minimum by relying more on correcting or eliminating other factors that contribute to pestilence. This is fast becoming

the most important benefit of IPM because the Nat'l and Academy of Science has estimated that 15% of the population has some susceptibility to chemicals with one percent suffering a severely disabling effect we now call Multiple Chemical Sensitivity (MCS). The Chemical Sensitive Disorder Association estimates that 45% of the population who suffers from allergies are also very susceptible to chemical sensitivity. MCS is a hypersensitive reaction to common chemical and environmental stimuli and reactions can be triggered at levels of exposure much lower than that of pesticide residues left after a single baseboard application! The reputation of chemical pesticides precedes itself since the illness is primarily viewed as an allergic reaction to chemical substances. While a medical debate on whether MCS is a valid disease rages on, it has already been classified as a disability under the American With Disabilities Act (ADA). Employers could be faced with ADA-inspired cases when workers with MCS demand reasonable accommodation to be able to work. MCS has also been recognized by the US Department of Housing and Urban Development as a basis for seeking protection under federal housing discrimination laws. In a recent case in Virginia, a MCS individual was successful in requiring the notification of all pesticide applications pending within a 7 day period. In fact, at least 15 states have or are considering MCS registries for notification of any type pesticide applications. There also has been effort on the federal level to create a national MCS register which will be open to all persons who want notification of pesticide application on adjoining property. Wisconsin and Connecticut do not even require medical verification for persons to be placed on their MCS registries. The public's misconception of pesticide related health risks has led to the advocating of mandatory pre-notification and posting at many state and federal levels. It appears as though written notifications will be required at most public institutions by 1994 ADA when they are. Facility managers will need personnel that can counsel a concerned public and staff. Other MCS cases have required landlords (at tenant's expense) to make modifications to ventilation systems and appliances. This 'pesticide induced anxiety' will be felt by all socioeconomic levels. The general public is especially concerned of chemical use in their living and working space. A recent survey by Pest Control Technology shows that people overwhelmingly (77%) are concerned about pesticide use in the workplace. Yet, 72% prefer to take some type of action at the sighting of a single cockroach. When asked whether pesticides caused cancer, two thirds of those polled said 'yes' and 54% believed the odor from pesticides was harmful. In fact, no pesticides currently used by pest control professionals today have proved carcinogenic, and the odors pose no health risks. It has been the history of urban pest problems to be targeted with a battery of chemical warfare. The ability of chlorinated hydrocarbon insecticides to annihilate insect pests is undeniable. However, the overuse of these chemicals has led to crisis situations in many instances in the form of pest resistance, pest resurgence, secondary pest outbreaks, environmental contamination, and hazards to human health, that prove far worse than the original pest problem. In fact, one of the most common practices of pesticide abuse (and increased chemical costs) still continues today in most pest control practices, under the guise of baseboard spraying (i.e. spray and pray). (This, despite the fact that one of the most reported causes of pesticide induced anxiety is the pesticide's odor). This practice is still common today because pest control decisions in public buildings are usually emotional decisions, and there is no reason to believe that people will develop any tolerance for insect or rodent pests in their presence. There is also the factor that pest control companies are in general revenue driven and not results driven. Most pest control companies are not likely to perform services that would preclude them from being able to come back next month for another routine service visit. An in-house operation will focus more on locating the source and

solving the pest problem. Another reason for the slow adoption of IPM is the slow implementation of Agricultural IPM concepts into Urban IPM practices. This is where programs like the one at the University of New Mexico (UNM) will play an important role in developing pest control concepts for the 21st century. Even though there is legal debate over the validity of MCS, those afflicted are more likely to continue pushing for accommodation of their condition in the courts and by voluntary mandination than those with less emotional agendas. By recognizing the liability and other legal issues, health issues from chemicals and pest related pathogens, pending Federal and state regulations, and mandatory notification of MCS victims in several states, UNM has taken a proactive approach to making the facilities more hospitable to MCS sufferers by implementing IPM in both landscapes and buildings.

The Implementation of IPM at The University of New Mexico

The plan developed at UNM is divided into 6 parts. Each can be implemented in various stages and modified to fit most University and institutional settings in both landscapes and buildings. The six basic parts of the UNM pest management plan are: (1) Develop a policy statement, (2) Set management objectives for each various site, (3) Inspect, identify and monitor pest populations on a regular basis, (4) Set action thresholds for each pest, (5) Apply IPM strategies for control and, (6) Evaluate results and keep written records. Although the objectives differ for landscape and indoor pest control, the IPM philosophy remains the same. As one can see, IPM is more than a reduction in the use of pesticides, it is a decision making process.

Development of a Policy Statement

The development of a policy statement will provide facility managers with an effective way to respond to a questioning public and at the same time improve the facility's internal decision-making process. A policy statement should be founded on the principles of IPM to ensure the safest, most reliable, pest control possible. A written policy will also provide procedural guidelines for the University to create specifications for contract pest control or written in more general terms, as guidelines for in-house operations. Developing a policy will educate applicators, administrators, and others about when and why pesticides are used and when alternative methods can be used. If problems do arise, the policy will help provide the facility manager with guidelines to handle the problem and help document that your facility has acted responsibly.

University of New Mexico's Physical Plant Department Pest Management Policy Statement

Pests are populations of living organisms that interfere with use of the University site for human purposes. Structural and landscape pests can and do pose significant problems to people, property, and the environment. The pesticides we choose to control these pests may also pose risks to people, property, and the environment. It is therefore the policy of the Physical Plant Department (PPD) to implement an Integrated Pest Management (IPM) philosophy for controlling pests. IPM is the philosophy of achieving long term, environmentally sound pest suppression through the use of a wide variety of technological advances and management practices. Control techniques in an IPM program extend beyond the application of pesticides, to include structural and procedural modifications to reduce the food, water, harborage, and access

used by people. Pests will be managed in order to: 1. Reduce any potential human health hazard or to prevent against a significant threat to public safety. 2. Prevent loss of or damage to University property and, 3. Enhance the quality of life for students, staff, faculty, and visitors. IPM procedures will determine when to control pests and whether to use physical, cultural, biological or chemical means. Strategies for managing pest populations will be influenced by the pest species and whether that species poses a significant threat to people, property, or the environment. Selected non-chemical pest management methods will be implemented whenever possible. The choice of using a chemical pesticide will be based on a review of all available options. Cost or staffing considerations alone will not be adequate justification for use of chemical control agents. The full range of alternatives, including no action, will be considered. When it is determined that a pesticide must be used in order to meet important management goals, the least hazardous material will be chosen for applications.

Staff, students, faculty, and the public will be educated about potential University pest problems and the IPM policies and procedures to be used to achieve the desired pest management objectives. Records of pesticide use shall be maintained on site to meet the requirements of the New Mexico Department of Agriculture. In addition, pest monitoring data sheets or other indicators of pest population are to be maintained to verify the need for treatments. Pesticide purchases will be limited to the amount anticipated for use during the year. Pesticides will be stored and disposed of in accordance with the EPA-registered label directions and state regulations. Pesticides must be stored in an appropriate, secure site not accessible to students, staff or unauthorized personnel. Pesticide applicators must be state certified and trained in the principles and practices of IPM and must follow label regulations and precautions.

Structural Pest Control Management Objectives

There is more to indoor pest control at colleges and universities than spraying baseboards in office spaces. There are hospitals, child care facilities, food plants, food services, clothing and laundry services, animal research facilities, museums and archival facilities, and other habitats that warrant pest control. Each with a different set of pest circumstances and management objectives; and each with it's own factors contributing to pest infestations.

The overall objectives in structural pest control are to provide a pest-free living and working space using the most economical, efficient, and environmentally sound methods of control. These objectives can be guided at each building or site by developing a Pest Management Plan, which details the site infestations and methods of control as well as other records which can be kept on site. A pest management plan for each site will be a valuable asset to maintenance and custodial staff and building managers or superintendents, who must frequently answer questions about pests and chemical use in their buildings.

Supporting objectives should include pest control services that do not adversely affect tenant health or productivity during the regular hours of operation. Observe all safety precautions, including providing additional personal protective equipment required for the safe performance of work. Objectives should also state that protective clothing, equipment, and devices should, as a minimum, conform to Occupational Safety and Health Administration (OSHA) standards for the products being used and all necessary steps to ensure the containment of the pesticide to the site of application.

The application of pesticides in occupied spaces other than crack and crevice treatments must be performed during "off" hours, on weekends, or other school break periods to reduce the exposure of pesticides to employees during working hours. On occasion, requests are made that the pest manager perform non-routine special or emergency services that are beyond a routine service request. An objective should be to respond to these exceptional circumstances and complete the necessary work within one (1) working day after receipt of the request. The favorable impression left by this response time and results obtained is reflected on the entire Physical Plant Department.

Objectives should call for the use of non-pesticide methods of control wherever possible such as, portable vacuums, trapping devices, and biological controls and that the application of pesticides in any areas inside or outside the premises should not occur unless visual inspections or monitoring devices indicate the presence of pests in that specific area. Preventive pesticide treatments of areas where inspections indicate a potential insect or rodent infestation are acceptable only on a case-by-case basis.

Objectives should also be stated for the protection of those applying pesticides. For example, all personnel should be trained as Agricultural Chemical Handlers under the Worker Protection Standards and should be furnished all supervision, labor, materials, and equipment necessary to accomplish the surveillance, trapping, and pesticide application components of the IPM program. Personnel providing on-site pest control service should also meet state and local requirements in the jurisdiction where the service is actually performed, for training, registration, or certification as Pesticide Applicators in the categories deemed necessary by the facilities needs. Certification in different categories are necessary to be able to assist in the identification and recommendations for a variety of pests. For instance, fumigation certification is necessary for the unusual pests which occasionally are encountered in museum specimens arriving from overseas. Vertebrate certification for recognizing fecal droppings and rodents which may be carriers of the Hauntavirus. Vector control certification for recognizing various mosquitoes, ticks, and fleas which may be carriers of viruses, bubonic plague, tapeworms, typhus, and other diseases which require immediate attention. Wood destroying organisms certification to recognize termites and their damage. Ornamental and turf certification for the proper identification of insects such as elm leaf beetles, box elder bugs, and false chinch bugs, which are pests of vegetation, but are frequent invaders of buildings. Uncertified individuals working under the supervision of a Certified Applicator should <u>not</u> be permitted to apply pesticides under these management objectives.

Inspections, Pest Identification, and Monitoring

The primary technique utilized in an IPM program will be inspection and monitoring. Many times cockroach control fails because the size of the initial roach population is underestimated. The initial inspection should be thorough enough to locate where cockroaches are living and in what numbers. It will also identify problem areas and any equipment, structural features, or management practices that are contributing to pest infestations. Access to all building spaces should be provided to ensure a complete inspection. The most important tools necessary for a successful inspection are a notebook, flashlight, caulking gun, and vacuum cleaner with a HEPA filter. These are the essential tools needed for a successful IPM program versus the pump-up sprayer used for traditional pest control services.

A common question about applying IPM is "How frequently should inspections be made?" After the initial survey is completed, the facility should be divided into high and low risk areas. High risk areas are those that provide energy, food, water, and harborage to support cockroach populations. Low risk areas are those where you would not ordinarily expect to find cockroach activity. High risk areas require more frequent inspections than low-risk areas. Monitoring traps are critical in low risk areas however, because inspections are not performed as frequently. The type of pest is also a factor in determining risk potential; for instance, Oriental roaches will have different high risk areas than German roaches.

Monitoring usually involves the use of traps, however any form of inspection is considered monitoring. Monitoring is not a control technique per se. It provides information to make a decision about which techniques need to be used and where treatments need to be directed. Treatments are made when activity is found, what type, how much, and where insecticides can be applied depends on the information provided by monitoring.

Proper identification is critical in the implementation of any IPM program. Identifying life stages, species, and habits are invaluable for evaluating control options. Different species have different "treatment windows" where the least toxic product can be applied in the most efficient and economical way. A building is a suitable habitat, and there are pests that exists as a population in that habitat. By knowing the biology and habits of the target pests and using monitoring data, decisions can be made as to whether control is necessary, what form it will take, and where it should be delivered. Having someone that knows where to look, how to look, and what tools are necessary to improve the chances of discovering pest infestations and eliminating them, requires a higher level of expertise than previously used at most university Physical Plant Departments. An IPM program should be designed to be active, adequately suppress indoor populations of the common indoor target pests. Target pests include cockroaches, ants, flies, wasps, any pests of stored products, silverfish, spiders, mites, and others. Usually, populations of these pests that are located outside of the buildings, but within the property boundaries of the buildings, are included. Bats, snakes, and all other vertebrates other than commensal rodents, termites and other wood-destroying organisms, mosquitoes, pests that primarily feed on outdoor vegetation, and nuisance birds, are usually excluded because of the expense of treatment and the time commitment. Individuals of all pests that are incidental invaders inside buildings however are usually covered under the objectives.

Developing Action Thresholds

Some are disgusted by them, some are emotionally distressed by them, and some are merely irritated being around them, but the fact is, no one wants to share their living space with the lowly cockroach. As a result, the action threshold for cockroaches is one, thus total elimination must be the goal of any cockroach control program. Action thresholds are a set of conditions that require a control action (usually a pesticide application). Action thresholds are determined by finding an infestation level that is intolerable to people or to structures or will cause unacceptable damage at various times of the year. The monitoring strategy will help determine when to treat. Over time, injury levels and action thresholds will change, however treatments are required when: regular monitoring indicates the pest population will reach the injury level if left untreated; or biological and environmental factors will not reduce the pest problem within a reasonable time; and

practices, pest and health and environmental risks are considered less than the potential pest damage.

Applying IPM Principles and Practices

Once the active harborage are located by inspection and the action thresholds determined, the decision focus on pest control options. Control options should meet the following criteria before being implemented (1). The material chosen is the least disruptive of natural controls. (2) It is the least hazardous to human health. (3) It is the least toxic to nontarget organisms. (4) It is the least damaging to the general environment. (5) It is most likely to produce permanent reduction of the pest. (6) It is the easiest to carry out effectively, and (7) It is the most cost-effective in the short- and long-term.

The first management decision in any pest elimination effort, should be altering, eliminating, or correcting any conditions which are primary factors in the pest infestation. This will reduce the amount of pesticide needed to eliminate the current pest problem. Failure to address these contributing factors will require that more pesticide be used, thus losing a main benefit of IPM.

Sanitation

Good sanitation practices are essential in cockroach and rodent management and unfortunately, are almost totally left for the working staff responsibility. If poor sanitation conditions are allowed to persist, controlling a cockroach or rodent infestation will require more time and considerably more pesticide. Therefore "customer" cooperation to correct contributing conditions is a must if any hope exists to minimize pesticide applications and still achieve the desired results. Cleaning and storing garbage correctly, cleaning floor drains and keeping food products properly stored negatively impacts pests' food supply. Repairing water leaks, improving ventilation and drainage, and maintaining such practices as hanging mops off the floor to dry, negatively impacts pests' water sources. A walk-through plan with custodial personnel to regularly schedule cleaning of critical areas is a most useful tactic. The UNM Physical Plant Department, Environmental Services Division, has also developed pest information fact sheets available to the campus community. These pest fact sheets inform the university community on how to minimize pest infestations through a variety of techniques designed to eliminate food, water, and harborage of pests. It gives no chemical suggestions. An education policy for the campus community is not only a public relations victory, but also involves the campus community in correcting sanitary deficiencies leading to pest infestations.

Exclusion

Denying pests accesses to harborages by sealing cracks and crevices and plugging holes is an easy task to accomplish. Sealing cracks and holes in a building's exterior and installing screens on windows and floor drains also excludes pests from entering from the outside. Each crack or void that is sealed will not require further treatment. Sealing cracks and crevasses denies pests from using them as shelter, and less shelter usually means less pests.

Control of pigeons usually requires excluding them from nesting and roosting sites. This can be accomplished by nets or wire spikes, although they must be discrete. Hardware cloth or other

[illegible] roofing materials can be used to replace air conditioning vents and other [illegible] on the roof [illegible] are [illegible] used by roaming and foraging bats.

Mechanical Controls

Physically removing pests by using traps or vacuums is immediate and effective. If 1/2 of the [illegible] cockroaches are removed by vacuum, the percent control is already [illegible] and the reproductive potential is also reduced [illegible]. Vacuuming can be done without employees evacuating the premises and the public does not see dead or dying roaches. Vacuuming is particularly useful after a flushing agent such as pyrethrum is used to get roaches to move out of harborages. Stale beer sprayed on a surface is a power attractant to roaches and exposes them to vacuuming.

Pesticide-resistant cockroaches are likely to exist in any population in buildings that have had a longtime roach problem and regular insecticide treatments based on a schedule instead familiarity. Vacuuming removes both pesticide resistant and susceptible roaches from the breeding population. Vacuums also remove crumbs, lint, and other potential food debris instead of pushing it to accumulate in a crevice. Any vacuum used for pest control work should be equipped with a High Efficiency Particulate Air (HEPA) filter to prevent proteins from dead, dried roaches, feces and egg capsules from becoming airborne and causing allergic reactions in people. Although it can be somewhat time consuming, vacuuming is very useful in an IPM program. Although traps may use a variety of sex and food pheromones to attract pests, they should be used as monitoring tools and not control treatments. Exceptions are traps for removing vertebrate rodents and pigeons. For a pigeon control program to be fully successful live trapping is an indispensable tool. Pigeon dual traps can be purchased from most pest control supply companies. By pre-baiting birds with whole corn, large numbers can be removed at once, gaining instant relief from the foul mess of their droppings. It is important to note that no matter how the birds are disposed of, none should be released back to the wild as they can navigate 300+ miles in a number of hours. Acoustical and other ultrasound devices used for pigeon control are best left in the catalogue.

Rodent control inside buildings should also be accomplished with trapping devices only. All trapping devices should be concealed out of general view and in protected areas, so as not to be affected by routine cleaning and other operations. Trapping devices must be checked on a regular basis, and trapping should not be performed during periods when maintenance will be delayed by holidays, weekends, etc. All trapped rodents and all rodent carcasses should be disposed of in a discrete and appropriate manner. Light traps are also useful for fly control where appropriate. Insect light traps are more popular in Europe than in the US, in large part because they are required by environmental health regulations as part of routine food trade pest control. Removing as many pests as possible using vacuums or traps is the ideal approach in an IPM program. However, it is unlikely that vacuuming and traps alone can result in total elimination of some pest infestations. In all instances, no pesticides are applied until visual inspections determine a need exists.

Chemical Controls

The hardy nature of cockroach biology and their reproductive potential especially German roaches require that some type of chemical insecticide application will be necessary to eliminate an infestation. When it is determined that a pesticide must be used in order to contain acceptable control decisions on active ingredient formulation and application techniques must be made. The least hazardous material with precise application technique and minimal quantity of pesticide should be chosen to achieve control.

One objective of chemical control should be to minimize the use of liquid pesticide applications wherever possible. Bait formulations rather than sprays should be used for cockroach and ant control wherever appropriate. Concealed bait formulations should be considered the standard for roach and ant control in a typical office space.

Liquid, aerosol or dust formulations should be applied only as crack and crevice treatments with application devices specifically designed or modified for this purpose. "Crack and crevice" treatment is an application in which the stream of pesticide is never visible. Application of pesticide liquid, aerosol or dust to exposed surfaces, and pesticide space sprays (including fogs, mists and ultra-low volume applications) should be restricted to unique situations where no alternative measures are practical. Liquid pesticides applied to exposed surfaces should be limited to micro-encapsulated products applied with a brush or sponge.

Some chemicals are preferable in an IPM program, such as precise placements of baits. There are numerous baits on the market today, and they can be applied in different ways. Pest managers must read the label to find out where they can be legally applied within different types of buildings. In the Pest Control Technology survey, 67% preferred baits rather than sprays be used at their workplace. Baits are more target specific than traditional control techniques, and in many cases have proven to be more cost-effective over the long term. Baits fit nicely into the IPM philosophy because only a small amount of active ingredient is placed at strategic points, and has no odor or drift. With traditional roach sprays, all of the hard-to-reach areas may need to be treated to achieve results and roaches are often repelled by the chemical residue. With baits, cockroaches are attracted to and feed on the bait. Baits alone will usually not control an infestation, so other types of insecticides are often necessary to supplement the chemical control part of the pest management plan.

Of all the insect pests, ants are the ideal subjects for the use of bait for control. This is due to their highly social habits, such as chemical recruitment to food sources and food sharing between other members. If a bait is sufficiently attractive to ants, it will be carried back to the nest and distributed through the entire colony.

In exceptional circumstances, rodenticides may be essential for adequate rodent control inside buildings. All rodenticides, regardless of packaging, should be placed either in locations not accessible to children, pets, wildlife, and domestic animals, or in EPA- approved tamper-resistant bait boxes. Frequency of bait box servicing should depend upon the level of rodent infestations. Bait boxes should be maintained in accordance with EPA regulations with an emphasis on the safety of non-target organisms. UNM standards mandate that the following 5 points be followed: (1) Bait boxes are placed out of the general view, in locations where they will not be disturbed by routine operations. (2) The lids of all bait boxes are securely locked or fastened shut. (3) Bait boxes are securely attached or anchored to the floor, ground, wall, or other surface, so that the box cannot be picked up or moved. (4) Bait is placed in the baffle-protected feeding chamber of the box and never in the runway of the box, and (5) Bait boxes are labeled with the manufacturer's label, pest managers business name and address, and dated at the time of installation and each

[illegible] because of the adverse reaction of the public regarding control that may include poison bait at UNM.

Insect growth regulators are also available in bait form. The most well-known effect of insect growth regulators on insect pests is the prevention of growing insects from becoming breeding adults. Although control is long term, it is typically slow acting, taking as long as 12 weeks for maximum effect. Studies at North Carolina State University show using insecticidal baits and insect growth regulators in tandem eliminates more cockroaches than either product used alone. Biological control baits, such as the Bio-Pest™ Cockroach control chamber, are odorless and contain no chemical pesticides. It has a zero rating on all National Environmental Policy Act Hazard Ratings. The chamber contains a microbial agent *Metarhizium anisopliae* that is lethal to roaches that touch it. Roaches are attracted to the chamber because it is dark and moist. Growth regulators are also available for pigeon control, however, due to the health hazards associated with pigeons, their use is too slow to satisfy the management objectives.

Chemicals are manufactured and formulated that can be directed into crack and crevices, and are odor free; these are the ideal chemicals to use. They get the insecticide out of sight and mind of the customer. The key to any effective cockroach control with insecticides is to apply them directly into cockroach harborages. If your policy statement states that "no visible stream of liquid pesticide shall be used", this will direct that all liquid pesticides be injected into crack and crevices or painted on by a brush applicator. These application techniques have proved extremely successful in eliminating long standing cockroach infestations at UNM.

Chemicals should be selected on a priority based on the toxicity signal word on the pesticide label or by the toxicity category of the pesticide. A checklist should be used for each chemical application. Choose the safest material based on label signal words, persistence in the environment, impact on non-target organisms, and potential chronic human health potential. Chemical labels have toxicity signal words, a quick indication of the mammalian toxicity of the chemical. These signal words are on every pesticide label with the corresponding LD_{50}. Caution label (LD_{50} [illegible] mg/kg), Warning label (LD_{50} of [illegible] - 500 mg/kg), and Danger label (LD_{50} up to [illegible] mg/kg). Due to new chemistry, the only products used at UNM that contain a Warning label are selected herbicides. No insecticides are used at UNM (indoors or out) that contain a Warning or Danger (skull and crossbones) label.

Chemical classes must be rotated to extend their usefulness as pesticides. Resistant genes in insect pests are under constant selection and can cause the loss of an entire classes of chemicals if resistance develops to an individual pesticide in that class. This is especially critical for pyrethroids due to the large number of insecticides in the class and our dependence upon them. In addition to rotating chemical classes, mixtures of three or more chemicals (if permitted by the labels) can increase efficacy and decrease the chance of resistant genes accumulating to insecticides in each class of chemicals included in the rotation. Chemicals are chosen from each class that are the least toxic for the management objective at hand, and should be used as spot treatments only. Make sure MSDS's, safety equipment, and clothing is on hand. Verify the person doing the application is certified and or qualified to handle the equipment and chemical and has been adequately trained. Make sure the application equipment is properly calibrated. Have a spill response and emergency plan with emergency phone numbers on site in a central location.

A list of commonly used insecticides for structural pest control is listed to help the pest manager rotate chemical classes. Find the trade name of the chemical you most frequently use in your pest

control [illegible] and [illegible] [illegible]. Make sure the chemical is registered in your state and read the label.

Classes of insecticides commonly used in structural pest control.

Organophosphates
Diazinon (Diazinon, Knock Out, TIGO)
Chlorpyrifos (Dursban, Hilthrasher, Engage, Empire, Equity, Duration)
Acephate (Orthene, Torandel)
Propetamphos (Safrotin)
Trichlorfon (Dylox, Larvo-Lan)
Malathion (Malathion)

Carbamates
Propoxur (Baygon)
Bendiocarb (Ficam W, Ficam Plus, Ficam G, etc.)

Pyrethroids
Pyrethrins (pyrenarins, Sectrol N-cide, Pyrenone, Exciter, Kilter)
Allethrin (Pynamin, Bio-Allethrin, Esbiothrin)
Permethrin (Torpedo, Dragnet, Perm-X, Prelude, Blockade, Command, Scribble, Defend)
Phenothrin (Sumithrin)
Fenvalerate (Tribute, Pyrid, Pydrin, Conquer, Chraguard)
Cypermethrin (Demon, Cyhoff, Ammo, Arrive, Barricade)
Cyfluthrin (Tempo, Optem)
Deltamethrin (Suspend)
Tralomethrin (Saga)
Lambda-Cyhalothrin (Demand, Commodore, Karate)

Insect Growth Regulators
Methoprene (Precor, Altosid)
Hydroprene (Gencor)
Fenoxycarb (Torus, Ultraban, Regulator)
Diflubenzuron (Dimilin)
Hexaflumuron (Sentricon)

Amidinohydrazone
Hydramethylnon (Combat, Maxforce, Siege, Amdro)

Macrocyclolactone Glycoside
Abamectin (Avert, Ascend, Roach-Ender)

Chlorinated nicotine derivative
Imidacloprid (Admire, Gaucho, Premise)

Synergists
Piperonyl Butoxide (PBO)
MGK 264
DEF

Fluorinated sulfonamides
Sulfuramid

Phenylpyrazole
Fipronil

Biological
Fungus (Bio-Path)

Nematodes.

Inorganics
Boric acid (Roach-Prufe, Roach-Kill, Perma-Dust)
Borates (Tim-Bor, Bora-Care)
Silica Gel - Drione, Tri-Die)

*No claim is made for the completeness of this list. The listing of a trade name or their failure to do so does not imply endorsement or lack thereof for any product.

Because of public environmental and health concerns about pesticide usage, there has been renewed interest in biorational pesticides such as boric acid. The use of "low impact" inorganic (boric acid, silica gel diatomaceous earth) and naturally occurring insecticides (pyrethrums and synthetic pyrethroids) instead of cholinesterase-inhibiting insecticides are always preferable.

The Pest Management Plan, Record Keeping and Project Evaluation

A building specific plan (Pest Management Plan) should be made for each site utilizing IPM. A pest management plan should consist of four parts: (1) Proposed method of control, labels and Material Safety Data Sheets (MSDS) for all pesticides used and a list of rodent bait boxes, insect and rodent trapping devices, pest monitoring devices, and any other control devices or equipment for each site. (2) A service schedule for each site with frequency of pest manager visits (although frequency of visits will vary from site to site, at a minimum, inspections should be made monthly to determine if treatment is required. Weekly monitoring should be the standard for buildings with a history of pest infestation.) (3) A description of any structural or operational changes that would facilitate the pest control effort, and (4) A copy of the Pesticide Applicator Certificate or License for every person who will be performing on-site applications. Also record the target pests and application site, date and time of application, common name of the pesticide, EPA registration number (s), concentration of the active ingredient (s), and volume of use-dilution applied. Designate someone with responsibility to carry out the work according to the Pest Management Plan for each building or site. Any subsequent changes to the Pest Management Plan, including additions or replacements to the pesticide list, and to on-site service personnel should be justified in writing by the pest manager. Outside contractors or in-house staff should not apply a pesticide product that has not been included in the Pest Management Plan.

Structural modifications for pest control including the applications of caulk and other sealing materials, should not be the responsibility of the pest manager. However, the manager should be responsible for recording in writing, any structural sanitary, or procedural modifications necessary to eliminate pest food, water, harborage, or access and distributed to those in charge of performing the necessary corrective work.

Establish a complete quality control program to assure the requirements of the pest control services are provided as specified. The evaluation program should include, but not be limited to the following: An inspection system covering the pest control services stated in the Pest Management Plan. A copy of the records should be kept on site and maintained on each visit by the pest manager. Upon completion of a service visit the person performing the service should complete, sign, and date a pest control service form and return it to the Pest Management Plan on the same or succeeding day the services were rendered.

Economical Considerations

In fiscal year 94 - 95, the PPD at UNM made blanket payments to an outside pest control contractor totaling $17,000 to service 64 buildings by spraying baseboards in office spaces based on a routine schedule and not by need. Other departments also had outside contracts with various pest control operations, bringing the total UNM payment to over $24,000 annually. Buildings not on contract were charged an additional $50 per visit. The indiscriminate of baseboard spraying is not only unjustified, it increased pesticide resistance of the targeted insects, as well as creating a pesticide residue and indoor air quality problem. Since the UNM structural IPM program was implemented, one-fourth of all pest complaints received required no pesticide application. These complaints were resolved by educating staff or using non-toxic controls (vacuum, caulk, etc.). At $50 per call, this would approximate $1,000+ in savings, and the staff are much more satisfied with the response time and the results. The UNM structural IPM program currently services over 170 individual buildings with only a modest increase in costs. The UNM IPM program is currently staffed by two full-time employees and treatment costs for structural operations should level out to approximately $5,000 annually. UNM now has the capability to do in-house termite work and specialty requests such as fumigation where required. (Several years ago a canoe from outside of the country came to the campus museum infested with powder post beetles. The cost of fumigation was approx. $1,000+.) In addition, pests such as rodents, feral cats, nuisance birds and termites were not included in previous contractual pest control efforts or were controlled illegally. Most importantly, trap monitor numbers indicated a decrease in pest activity prior to the initiation of an in-house IPM program. The few pests killed in office spaces were not offset by the huge numbers reproducing in drains, basements, attics, etc. Since the IPM program, trap catches indicate complete control in many instances and 90%+ reduction in pest numbers in all others. Instead of focusing on pest control in office spaces, rarely is there ever a cockroach seen crawling on a baseboard. UNM is focusing on areas such as mechanical and custodial rooms, basements, utility tunnel systems, sewer channels and other areas below ground, and refuse storage areas no pest control contractor would ever venture. These areas do require year-round monitoring on a bi-weekly basis to prevent the resurgence of pests and require a much higher level of expertise than past traditional pest control practices. Current customer complaints have been dramatically reduced and when requests are now made, it is for the removal of a single pest that has wandered through an open door or window and not for an infestation.

Summary

Structural IPM principles attempt to achieve long term, environmentally sound pest suppression through the use of a wide variety of technological and management practices. Control techniques in a structural IPM program extend beyond the application of pesticides, to include the structural and procedural modifications necessary to reduce the food, water, harborage, and access used by pests. While the program does modestly increase the cost of pest control, results are dramatically improved, employee satisfaction is much higher, and environmental issues are satisfied.

Landscape Pest Control Management Objectives

The primary objectives in managing a large scale landscape like the UNM campus were to improve the decision making regarding the need for control tactics providing better selection and timing of controls, and reducing the amount of chemicals being applied. These objectives will allow UNM to reduce economic and environmental costs associated with unnecessary or poorly timed sprays and improve the aesthetic quality of the UNM campus arboretum. Just as a key component of structural IPM is the identification and knowledge of pest biology, landscape IPM programs must have someone trained to identify plants and pests, and have knowledge of their biology. The potential diversity of plants and their associated insects and cultural requirements presents a complex array of identifications, diagnoses, and control actions. Selecting an appropriate plant for a location and providing for its basic growth requirements are other critical aspects of landscape IPM. In an IPM program, plants are inspected regularly for signs of pest activity and when appropriate actions are taken, they are chosen to conserve beneficial organisms and minimize pest damage. Landscape managers have many tools available to them for pest control the key, like structural pest control is knowing when and how to use them. Ornamental IPM allows the landscape manager to deal with plant problems in economically and environmentally sound ways while improving the aesthetic quality of their plants. The program at UNM is generating valuable information on the types of plant materials used, their susceptibility to insect and disease, and the relative importance of each pest encountered.

Inspections, Pest Identification, and Monitoring

Inspection and monitoring are the main elements of landscape IPM and are the most time consuming factors. However, monitoring plants can be made more efficient by grouping the plants in categories based on their importance to the landscape and management objective. The plants that are the most important to the management objectives are called 'key plants'. Key plants are those plants that provide aesthetic or functional attributes that contribute significantly to the value of the property. They form the focus of the management program. Key plants are fed upon, in return, by 'key pests'. Key pests are those serious, perennially occurring, persistent pest species that dominate pest management practices. Once the key pests and key plants are identified, management activities such as monitoring and pesticide applications can be concentrated on relatively few plants. An awareness of the pest prone plants allows the landscape designers to create landscapes with fewer pests and lower long-term maintenance costs. The task of designing your control program to be proactive rather than reactive is much easier. Although mapping requires work, it greatly simplifies the ability to track plant quality over several seasons. Included on the landscape map are the plant species and condition, sunlight patterns, soil characteristics, water runoff patterns, utility line and irrigation. Good records are crucial for program evaluation and improvement. It also helps determine the scouting system for each plant species designated as key plants. By concentrating monitoring and control activities on key plants, landscape managers can optimize the use of time and materials at each site. On a regular basis each plant or plant units are inspected for insect, mite, disease, and cultural problems. Develop and use a standard system for rating plant conditions. Inspecting requires regular scouting for pests and evidence of pest damage. Sampling methods must accurately assess the number of pests and beneficial organisms per unit of choice. This helps determine population trends to help in decision making. All sampling procedures must share certain characteristics. [1] They should use a common sampling unit for each plant species, such as leaves, terminals, net sweeps, or minutes, that are

consistent with the feeding habits of the key pests under observation. (2) The number of samples taken must be adequate. Pests are seldom distributed uniformly over a tree or shrub, or or they are only distributed within plant groupings. The number of samples taken from each plant at each time should be the same over the sampling period and over the entire group of plants. Pheromone traps (sex attractants), sticky traps, beating nets, light traps, vertical traps, and numbered counts are all monitoring techniques that will help determine when to initiate control measures, not if control measures should be used.

Developing Action Thresholds

Some landscape pests and their damage can be tolerated. This concept is fundamental to landscape IPM. The difficult part is determining at what point must some action be taken to prevent the damage from becoming unacceptable. For instance, in New Mexico, it has been previously determined that the action threshold for defoliating insects is a 15% reduction in leaf surfaces. Below 15% defoliation, the aesthetic value of the plant has not yet been compromised. Above 15%, plant quality begins to decline to a point that it is visibly noticeable and becoming unacceptable for the UNM campus arboretum objectives. Action thresholds will differ from one individual to another and from season to season. Have a plan in mind that will incorporate changes in seasons and in plant development. The damage level which you choose should include the following considerations: (1. Location of the plant in the landscape. Specimens in the backyard, along freeways, or seldom used areas may tolerate higher levels of pest damage than those in high visible and high value areas. (2. Pest potential. Pests which threaten the life of the plant will be managed at lower levels than those which only disfigure. Pests which are difficult to control such as bark beetles and borers, may best be managed by preventative means. (3. Pest population dynamics. Whether the pest population is increasing or decreasing. If the population is decreasing, delay any control tactics until the next sampling interval and. (4. Time of year the infestations occurs. Late season defoliation by pests such as fall webworm may not need controlling, whereas early season defoliators such as sawflies need strict monitoring.

One can also estimate the impact of biological control by counting the number of natural enemies per sampling unit, then calculating the ratio of affected pests to healthy ones. If signs of biological control are apparent, delay any insecticide treatment until next sampling. At next sampling, if the natural enemy population is increasing faster than the pest, further delay insecticide treatments. If pest populations are increasing faster than its enemies, and the aesthetic level of the plant is approaching unacceptable, then consider controls which will offer some protection to natural enemies and reduce the target pest.

Applying IPM Principles and Practices

When landscape ornamentals are attacked by pests, there is rarely any one control option that will stand alone to control the pests or prevent future attacks. The most crucial information for successful control is on the biology of the pest. This information will be important in assembling the various strategies for the management of the pest. All control options available will then be best applied at the precise time and place where the pest is a severe problem. Assuming the proper plant is placed in the proper location in the landscape, apply physical strategies first, such as

pruning, trapping, squashing, or the use of barriers. Next, identify where modifying existing cultural practices such as fertilizer, watering, and planting practices, can help alleviate pest problems. Then decide whether releasing biological control organisms is appropriate. If not, then choose a chemical control program with low pesticides such as horticultural oil or insecticidal soap if appropriate, which are not harmful to beneficial organisms.

Physical Strategies

Physical strategies include hand removal and the use of screens, barriers, or traps. These methods are some of the oldest, simplest and effective of all insect control strategies. Mechanical methods are used less often in commercial operations because they are often more labor intensive, however, they are very suitable for landscapes and gardens when used as a monitoring tool. Insects can be removed by hand and destroyed or dropped in a can of soapy water. Egg masses and aphids can be easily crushed. Tomato hornworms, bagworms and mistletoes can all be easily picked by hand to reduce potential infestations. Insects can also be effectively removed with a strong stream of water from a hose. Damaging levels of aphids, scale crawlers, whiteflies, spider mites and many eggs can be kept under control if they are washed off frequently. Selectively pruning off the tips of branches that harbor colonies of caterpillars is best done when pests are small. Many caterpillars are gregarious feeders and can be removed all at once. Many bark beetles and borers breed in stressed, dying, or recently dead wood. When new adults emerge they frequently attack nearby living trees under stress. Remove dead and dying wood and cover with plastic, burn, chip or bury.

Screens and barriers exclude pests from the desired plants. For example, a thin copper sheet metal is an effective barrier against moils and slugs. Treat honeydew-producing insects by also controlling ants which interfere with maximum parasite and predator activity. Sticky bands and insecticides aimed at ant control will also reduce the amount of indoor pest complaints from ants entering through doors or windows. Many types of traps can be used to monitor pests and some may reduce pests levels. Yellow sticky traps are highly attractive to whiteflies, aphids, thrips, leafhoppers and other small flying insect pest. They can be very effective for control of those pests in greenhouses. Yellow sticky traps can be easily made by coating a previously painted can lid or other disk with oil or sticky substance. Monitor insect levels so that other control strategies can be more effectively timed.

Cultural Strategies

Cultural strategies include manipulating the environment to make it less attractive for pests. Begin by selecting landscape ornamentals and turf that are well adapted to the local environment and soils. Many plant varieties also are available with varying degrees of insect and disease resistance. Those plants identified as resistant should be considered first for planting. Incorporate practices that prevent pest damage such as thinning rank vegetation. Rank vegetation creates an environment favorable for the development of many scale insects. The increased air circulation and light penetration are also important in natural predator survival. Maintain high plant vigor to prevent attack from bark beetles and borers. Many studies have concluded that trees are often attacked that have been stressed by drought, root disease, root compaction, construction damage, air pollution, poor growing site, or old age. Avoid flush pruning cuts which are attractive to bark

beetle borer, and death rings are prime pests prone to borer attack during the time of year [illegible] and [illegible] more actively feeding in the spring or summer. Never fertilize excessively prune trees.

Plant trees and shrubs that are resistant to the key insects in your area. Pests do not attack every species of plant within a genus equally. Low numbers of pests may occur on resistant plants, but these levels are more easily kept below action threshold numbers. Note that resistance does not mean immune. Some insect pests such as root weevils and boring insects can only be effectively managed by cultural activities.

Rotation of herbaceous crops is important in minimizing damage caused by soil inhabiting pests such as nematodes, wireworms, and many disease causing fungi. Avoid planting varieties in the same areas year after year. Always remove dead branches from trees and shrubs and destroy by burning or composting. Insects and mites often overwinter in plant residues as eggs, larvae, pupa or adults on the ground or in the soil. Pathogenic fungi also survive in plant residues and diseased plant parts. Using diseased or insect infested plant material as mulch is not advisable. Composting or deeply tilling in twigs, leaves, and grass clippings helps eliminate many overwintering sites. During the growing season fruit should be timely harvested. Over ripened fruit serve as breeding sites of injurious insects and diseases and should be picked up.

Any plant considered a weed, should be promptly removed and destroyed. Weeds serve as reservoirs for insect vectors such as leafhoppers, aphids and grasshoppers. Mulches can be used to reduce weed populations and to moderate temperature and moisture levels in the soil. Soil testing each year will help determine adequate fertility levels and reduce unnecessary applications of nitrogen. Excessive nitrogen encourages insect and disease incidence and makes plants less winter hardy. Trees, shrubs and turf should be deep watered infrequently instead of more shallow watering. These practices promote vigorous and healthy growth which is less attractive to insects and diseases as well as less optimal requirement for weed competition.

Biological Strategies

An important strategy in IPM is the use of beneficial organisms such as natural predators, parasites, or pathogens to keep pests under damaging levels. Beneficial organisms can be commercially obtained and released into the environment or they can be conserved and encouraged by modifying existing cultural and chemical control practices.

Natural populations of beneficial insects, mites and nematodes, and entomopathogenic fungi are invaluable in reducing infestations of plant pests. If predators such as lady beetles, lacewings, syrphid flies, mantids, wasps, predaceous mites and thrips and parasites are observed through scouting, take steps to insure their survival. If pest control becomes necessary, select the management strategy that is the least disruptive to natural enemies. Note that some level of pest infestation is required and should be tolerated to attract and maintain natural enemy populations. Management, rather than eradication, of the pest is the IPM objective.

Many species of beneficial organisms are mass-reared can be purchased from commercial suppliers for release into the environment. Using beneficial organisms requires detailed knowledge of the predator-prey-parasite-host cycle. Accurate timing and careful management are necessary. In the long run, it is often more advantageous to encourage and conserve naturally existing enemies through wise pest management practices. If natural controls are not operating, and the action level is met, use a material that is specific to the insect pest such as *Bacillus thuringiensis*

for the control of most far as beneficial remainder for the control of various beetles and wood boring insects or natural pathogenic diseases marketed for the control of specific beetles.

Chemical control

When pesticides are chosen for pest control they should be combined with nonchemical control methods for the best results. Use the least hazardous pesticide at a spot treatment only and be sure the pesticide is registered and appropriate for the use on the plant and site. Next select a material that causes minimal disruption to enemies such as insecticidal soap, horticultural oils or systemic insecticides. Spot treat only plants that are in immediate need of an application, leaving untreated plants to serve as a reservoir for natural enemies. Landscape managers continually face the same problems as those in agricultural systems when chemical pesticides are used and selectively remove beneficial insects from the system. These are the buildup of resistance, rapid resurgence of pests, and the outbreak of new pests.

Least toxic products should be chosen first for any chemical pest control. Pesticides that are low in toxicity are a preferred choice in an IPM program such as horticultural oil and insecticidal soap. These products are essentially non-toxic and kill by physical means such as suffocation and desiccation. However, the fact that they are less toxic and pose fewer environmental risks, also means they break down quickly and are slower to achieve the desired results. On the other hand you will not have the same risks and safety precautions as with more toxic pesticides.

Program Evaluation and Record Keeping

Be flexible, review the IPM program regularly and incorporate necessary changes. Optimal pest management is achieved by a variety of techniques. Eradication is not achievable or desirable since moderate pest levels help maintain natural enemies and pesticide resistance is slowed. Controls should be applied only when pest populations have reached an action threshold. The performance of any practice should be continually reevaluated to determine if it is achieving the desired result in the most effective manner.

Reevaluate the management techniques to determine the effectiveness of the treatment actions and to make sure your IPM program is working properly. Establish a good record keeping system. Good records are crucial for program evaluation and improvement. They will enable the landscape manager to examine the relationships among the types of plants encountered in these systems and the frequency of problems encountered. By recording the relative abundance of the 25 most common genera of landscape plants encountered and their contribution to the number of insect, disease, or cultural problems, a ranking of plants can be made according to their propensity of problems of any kind. Records should also include pest ID, dates, population size, location, plant species and variety, sampling method used, management decisions made and their effectiveness. Other records to keep during inspections include (1). The presence of insect predators, such as ladybird beetle adults and larvae, lacewing larvae, syrphid fly larvae, and spiders. (2). Evidence of parasitism such as aphid 'mummies', darkened greenhouse whitefly pupae, and scale insects with parasite exit holes present and, (3). Signs of insect diseases such as blackened, dead caterpillars and dead, discolored weevils infested with fungi. Previous research shows that if 15% to 20% of an aphid colony is parasitized, then natural controls will cause the eventual collapse of the colony and a pesticide application is not warranted.

After the growing season is over, review the information and plan ways to improve your pest management next year. You will begin to detect certain patterns, such as more pest damage on certain varieties or planting areas. Records keeping allows evaluation of control practices to determine which ones were effective and which need to be modified. Use your records of plant quality to determine if your pest control methods have been effective. Has your IPM program helped you to meet the standards of plant quality set in your management objectives? Has there been an increase or decrease in the number of complaints or call-backs? Compare the current and previous pesticide usage to determine how it has changed. Summarize your IPM records to help focus your future pest management effort. Most pest problems are caused by a few pests. Make your IPM effort more efficient by focusing control and personnel training on these key pests. Use scouting records to determine key plants that are most likely to have problems in the future. These are usually plants with a history of pest problems. If you find that particular plant is most likely to need repeated pesticide sprays you can reduce your pesticide use by improving the timing of your controls. You may find plants you want to avoid planting in the future.

Record keeping allows one to see that certain plants are often beset with a great variety and number of insects, mites, diseases, and cultural problems. Time can be reduced by replacing pest prone plants with those that are more resistant to insects, diseases, and environmental stress. These plants probably deserve more attention in landscape design and construction.

Economic Considerations

Most university and institutional grounds departments already have a pest control budget. The cost of initiating the IPM program at UNM however was increased due to the serious problems of mass plantings of one species of plant that had occurred prior to the IPM program. Mass plantings create an ideal environment for pests that can be difficult to control otherwise and past pest control practices were not sufficient to prevent large scale build-up of some important pests. Costs during the second and subsequent years should see a significant savings in material and labor costs due to more selective use of pesticides, especially dormant oil sprays for scale control. Break down the costs of the IPM program into 3 main categories: Plant Scouting, Record Handling, and Pesticide Application. This will identify where your program can be improved.

By substituting problem free genera for problem prone ones, landscape planners will greatly reduce the long-term problems and costs associated with maintaining the landscape. Landscape planners should take advantage of this type of information and incorporate this into their design decisions.

Summary

Integrated pest management provides principles and guidelines for the environmentally safe manipulation of pests. It provides the framework for the application for all suppressive tactics for pests. IPM is not a difficult concept to learn and implement. To achieve satisfactory habits, find where the pest is living and determine what continuing factors are supporting the infestation. The next step is to decide which factors can be changed or remove to reduce the infestation. Select nonchemical techniques wherever possible and limit insecticide applications to the plants where the pests are living and breeding. Knowledge is the key. IPM requires thinking and planning. One must also consider the synergistic effects of products in pest control.

As a result of the growing concerns about health and environmental problems associated with pesticides, University u.s are facing increasing demand from their employees, the University community and the general public, to justify their use of chemical pesticides. Legislation is continually being introduced at both federal and local levels requiring the adoption of IPM and reduced pesticide use in public schools including colleges and universities. Facility managers must be able to respond with careful answers about the complex management of insects, plant pathogens, weeds, rodents, and other pest organisms. Applying pesticides safely and effectively in public areas requires substantial expertise and skill. The knowledge of the characteristics and potential hazards of pesticides is important today, but will become critical in the future when the full impact of the American with Disabilities Act affects the University workplace.

With planning, landscape managers should be able to establish a well balanced system for maintaining long-term plant health that is ecologically based to prevent unacceptable pest damage to landscape ornamentals. Finally, programs like the one at UNM are generating a much needed data base documenting the occurrence and status of pests in the Southwest region.

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APPENDIX G: HAZARDOUS CHEMICAL WASTE PROGRAM AND CAMPUS PARKING HANDOUT

4.07 HAZARDOUS CHEMICAL WASTE PROGRAM

The University of New Mexico (UNM), like any other large and complex academic institution, uses a wide variety of chemicals as a result of its facilities management, academic, teaching and research activities, which generate a variety of hazardous chemical wastes. This program contains requirements for practices designed to protect University faculty, staff, students, volunteers, contractual services employees, visitors, UNM facilities, and the environment from the hazards of various chemical wastes that may accumulate as a result of University-related activities

UNM is classified as a hazardous waste generator by the U.S. Environmental Protection Agency (EPA) and the Hazardous Waste Bureau of the New Mexico Environment Department (NMED), and has been assigned an EPA identification number (ID#NMD980621197). The guidelines in this program are designed to create straightforward management practices, and are consistent with the Resource Conservation and Recovery Act (RCRA).

A. SCOPE

This program is applicable to all UNM employees, staff, faculty, volunteers, contractors, students and visitors that generate hazardous chemical waste during any University-related activities at the Albuquerque Campus. Operations by the University of New Mexico, not located within Albuquerque, New Mexico (i.e.: Branch campuses, research stations, ranches, etc.) shall use the information contained herein as a guide. However, in no instance should the operation handle, store or dispose of hazardous waste in such a manner as to cause an infraction of the Resource Conservation and Recovery Act (RCRA). These operations are encouraged to contact the Safety and Risk Services Department, Attention, Manager, Chemical Hygiene to periodically review their program for the handling, storage and disposal of such wastes.

B. MISSION

In November of 1980, RCRA was passed by the U.S. Congress to control the generation, storage, treatment, transportation and disposal of hazardous chemical waste. The Environmental Protection Agency (EPA) was given the responsibility of administering these regulations. Although many wastes are hazardous by nature, those specific wastes regulated by RCRA have come to be known as "*EPA Hazardous Waste*."

The University of New Mexico has assigned the responsibility of managing all chemical waste at the Albuquerque campus to the Department of Safety and Risk Services (SRS). In addition to the regulations governing the generation and disposal of EPA Hazardous Wastes (40 CFR 260-271), it is also important that UNM personnel become aware that there are regulations concerning the discharge of wastes into sanitary sewers. These regulations are addressed in SRS's Wastewater Program (Section 5.09 in the SRS Manual), which restrict the quality and quantity of wastes that may be disposed into the sanitary sewer system.

C. DEFINITIONS

Chemical Spill – Includes, but is not limited to, any unplanned or uncontrolled release of any liquid, semi-solid, solid or gaseous hazardous chemical that can pose a potential safety or health

risk to people or the environment. Many clean-up materials will become hazardous waste. The disposal of spill clean-up materials is the sole responsibility of the SRS staff.

Facilities - Facilities covered under this program include, but are not limited to, all UNM-owned and all UNM-leased structures and property.

Hazardous Chemical - Any solid, semi-solid, liquid, or gaseous chemical which may pose a recognized physical hazard or a health hazard to humans. This would include, but is not limited to, the following: corrosives (acids, bases); paints; petroleum products (gasoline, diesel fuel, oil, etc.); poisons; oxidizers; air or water reactives; and solvents (paint thinners, alcohols, etc.).

Hazardous Materials, Collected by SRS for Disposal –

Universal Waste – Batteries, pesticides, lamps, and mercury-containing equipment.

Other Waste – Ballasts, printed wiring boards, and used oil.

Hazardous Material – Infectious, asbestos and polychlorinated biphenyls.

Hazardous Waste, as Defined by EPA Regulations –

- Waste exhibiting at least one of four characteristics: ignitability, corrosivity, reactivity or toxicity;
- Waste appearing in special EPA lists (see attachment B, also go to www.epa.gov >hazardous waste >p list or >u list).

Health Hazard – Chemicals may cause various acute or chronic adverse health effects in exposed employees, such that they may be classified as carcinogens, reproductive toxins, sensitizers, hepatotoxins, mutagens, teratogens, nephrotoxins, neurotoxins, etc.

Material Safety Data Sheet (MSDS) - Written or printed material prepared by the manufacturer of a hazardous chemical that contains information about the hazards of the chemical, the appropriate work practices required for safe use and spill cleanup and other relevant information.

Physical Hazard - A hazardous chemical with physical characteristics that make it combustible, explosive, pyrophoric, corrosive, radioactive, flammable, reactive, a compressed or cryogenic gas, an organic peroxide or an oxidizer.

D. RESPONSIBILITIES

1. Safety and Risk Services Department (SRS) is responsible for:
   - Developing and implementing a University-wide program;
   - Providing advice on hazardous waste management services;
   - Providing technical assistance during emergency incident responses;
   - Monitoring compliance with this program;
   - Conducting periodic audits of satellite accumulation sites;
   - Assisting Principal Investigators and others in performing hazardous waste determinations;

- Collecting properly packaged waste from the generator upon request (Att. D1);
- Maintaining databases and inventories of all wastes generated at UNM;
- Maintaining the primary UNM accumulation facility; and,
- Providing for the disposal of EPA and other types of hazardous waste generated by UNM operations.

2. Deans, Directors and Department Heads responsibilities include, but is not limited to:
   - Ensuring departmental compliance with all the procedures outlined in this program; and
   - Assuring compliance with RCRA.

3. The Principal Investigator/Director/Supervisor of the laboratory is responsible for:
   - Ensuring compliance with this program in the laboratories/facilities;
   - Determining whether the waste is a listed, characteristic, or other type of hazardous waste;
   - Using containers for hazardous wastes that are compatible with the wastes, are in good condition, do not leak, and are closed when wastes are not being added or removed;
   - Properly marking waste containers with the start date and the words "Hazardous Waste";
   - Completing a tag (Att. C) specifying the contents, and attaching to the waste container;
   - Limiting accumulation of acutely hazardous waste to one quart (www.epa.gov, >hazardous waste >p list);
   - Limiting accumulation of all other wastes to less than 55 gallons (www.epa.gov, >hazardous waste >u list);
   - Submitting a Hazardous Material Disposal Request Form (Att. D1) to SRS for waste pickup; and,
   - Assuring compliance with RCRA.

4. Laboratory personnel are responsible for:
   - Knowing and following the provision of this waste management program;
   - Accurately labeling all containers with the accumulation start date, the words "Hazardous Waste", chemical names of all constituents (Attachment D1;
   - Assuring compliance with RCRA; and
   - Properly segregating and packaging all unwanted hazardous materials in laboratories and shops for disposal, including but not limited to chemicals, radioactives, infectious, batteries, used oil, printed wiring boards, PCB-containing ballasts, fluorescent lamps, etc.

E. DETERMINATIONS OF "EPA HAZARDOUS WASTES'

EPA and NMED regulations specifically require the person who generates a waste is to determine if it is a "hazardous waste" by investigating whether it is a "listed" hazardous waste (Attachment B and www.epa.gov >hazardous waste >p list or u list), and/or determining whether the waste may exhibit any of the "characteristics" of ignitability, corrosivity, reactivity, or toxicity by either having the waste tested or applying knowledge. Contact SRS at 277-2753 for any assistance needed in making these determinations.

1. Characteristic Wastes - IGNITABILITY

Any waste exhibits the characteristic of ignitability if a representative sample of the waste has any of the following properties:

1. It is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume and has a flash point less than 60 degrees Centigrade or 140 degrees Fahrenheit;
2. It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard; or
3. It is an ignitable compressed gas (40 CFR 261.21(a)(3).
4. It is an oxidizer such as a chlorate, permanganate, inorganic peroxide, or a nitrate, that yields oxygen readily to stimulate the combustion of organic matter.

2. Characteristic Wastes - CORROSIVITY

Any waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:

1. It is aqueous and has a pH less than or equal to 2.0, or greater than or equal to 12.5, as determined by a pH meter; or,
2. It is a liquid and corrodes steel at a rate greater than 6.35 mm per year at a test temperature of 55 degrees Centigrade

The City of Albuquerque restricts discharge to the sanitary sewer to materials with a pH between 5.0 and 11.0. If the corrosive waste exhibits no other hazardous characteristic and contains no listed hazardous wastes and laboratory personnel have the knowledge and facilities to adjust corrosive wastes to a pH within the allowable pH range, they are encouraged to do so as long as the resultant discharge contains acceptable levels of other contaminants and the discharge temperature is a maximum of 140°F (see SRS's *Wastewater Discharge Program* for allowable discharge limits). Otherwise, SRS staff should be contacted to pick-up these wastes for treatment and disposal. **NOTE: Water cannot be used to intentionally dilute a waste below a regulatory limit.**

3. Characteristic Wastes – REACTIVITY

A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties:

1. It is normally unstable and readily undergoes violent change without detonating;
2. It reacts violently with water;
3. It forms potentially explosive mixtures with water;

4. When mixed with water, it forms potentially explosive mixtures with water;
5. When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment;
6. It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment;
7. It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement;
8. It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure; and,
9. It is a forbidden Class A or Class B explosives.

4. Characteristic Wastes - TOXICITY

Any liquid that exceeds the listed concentrations of the following toxic materials and also any solid, whose aqueous extract from a special EPA Test Method called the Toxicity Characteristic Leachate Procedure (TCLP) exceeds these concentrations, this material then is regulated by EPA as a toxic waste. The toxic materials and concentrations are:

Toxic Material	Concentration in mg/L
Arsenic	5.0
Barium	100.0
Benzene	0.5
Cadmium	1.0
Carbon tetrachloride	0.5
Chlordane	0.03
Chlorobenzene	100.0
Chloroform	6.0
Chromium	5.0
o-Cresol	200.0
m-Cresol	200.0
p-Cresol	200.0
Cresol	200.0

2,4-Dichlorophenoxy Acetic Acid	10.0
1,4-Dichlorobenzene	7.5
1,2-Dichloroethane	0.5
1,1-Dichloroethylene	0.7
2,4-Dinitrotoluene	0.13
Endrin	0.02
Heptachlor (and its epoxide)	0.008
Hexachlorobenzene	0.13
Hexachlorobutadiene	0.5
Hexachloroethane	3.0
Lead	5.0
Lindane	0.4
Mercury	0.2
Methoxychlor	10.0
Methyl ethyl ketone	200.0
Nitrobenzene	2.0
Pentachlorophenol	100.0
Pyridine	5.0
Selenium	1.0
Silver	5.0
Tetrachloroethylene	0.7
Toxaphene	0.5
Trichloroethylene	0.5
2,4,5-Trichlorophenol	400.0
2,4,6-Trichlorophenol	2.0
2,4,5-Trichlorophenoxy Acetic Acid	1.0

(Silvex)	
Vinyl chloride	0.2

5. Listed Wastes – EPA's U-List, P-List and F-List

The EPA regulations issued under RCRA include lists of chemicals which must be disposed of as hazardous waste. EPA's U-List includes spill residues, off-specification chemicals, discarded commercial chemical products and container residues. EPA's P-List contains very specific substances indentified by EPA as being "acutely hazardous". EPA's F-List includes such materials as waste solvents, sludges from electroplating operations, and cyanide solutions from plating baths. The lists which are pertinent to University-generated wastes are found in the EPA regulations at www.epa.gov >hazardous waste >p list or >u list. Additionally, if any of these chemicals are present in a chemical mixture or solution, that mixture or solution must be disposed of as EPA regulated hazardous waste. These EPA lists do not include synonyms; therefore, all names of a chemical should be checked against the lists. (An example is Methyl Ethyl Ketone = 2-Butanol = Methyl Acetone.)

6. Other Miscellaneous Wastes

Safety and Risk Services staff collect and manage wastes other than those which are strictly regulated by EPA and NMED under RCRA or SRS's *Wastewater Program*. They are:

1. **Toxic Materials:** The number of listed wastes is very small compared to the number of toxic chemicals in existence. It is the University's policy to collect and dispose of as hazardous waste any chemical which is designated as toxic in the literature. This ensures that the University will minimize safety, health and environmental hazards, and will also minimize potential future liability for environmental problems.

2. **Used Oil:** Used pump oils, lubricating oils or other oils are collected and recycled. If possible, used oil should be kept as uncontaminated as possible. It is important that campus personnel label oils that have been potentially contaminated with hazardous chemicals or other materials, so that these oils will not be combined with automotive oils for recycling. Oil that contains PCBs (polychlorinated biphenyls) also cannot be recycled, are strictly regulated, and must be disposed of as hazardous waste.

3. **Infectious Waste:** Solids must be accumulated in labeled red bags for pickup by Stericycle. Liquids and semi-solids may be sewered in Albuquerque directly without sterilization. Sharps must always be placed in rigid plastic containers designed to prevent injury to handlers of this waste. Steam sterilization (via autoclave) is no longer allowed at UNM to transform infectious waste into non-infectious waste and thus dispose of it into the normal trash unless authorized to do so through a signed agreement with SRS. (Refer to Infectious Waste Program in SRS Manual)

4. **Asbestos:** Asbestos must be handled only by properly trained staff or contractors. Contact SRS if asbestos disposal is required. (See SRS's Asbestos Program for details.)

5. **Batteries:** Lead-acid batteries are recycled through SRS. Alkaline and Carbon-Zinc batteries can be disposed of in the normal trash. All other batteries must be disposed through SRS.

6. **Polychlorinated Biphenyls (PCBs):** Many electrical items, such as fluorescent light ballasts, electrical capacitors, transformers and power supplies, may contain PCBs and are therefore regulated wastes. PCBs are highly persistent in the environment and they must be disposed through SRS.

7. **Printed Wiring Boards (PWBs):** These items must be disposed of through SRS due to their heavy metal content (i.e., lead, silver, cadmium).

8. **Fluorescent Lamps:** These lamps contain small amounts of mercury and can be recycled for their glass, aluminum, and mercury content, and must be disposed through SRS.

F. WASTE ACCUMULATION AND DISPOSAL

There are certain *critical requirements* that each and every generator of hazardous chemical waste must follow as a Satellite Accumulation Area. They are:

WASTE ACCUMULATION

1. Consider all waste chemical formulations (abandoned, used, out dated, or otherwise) as a hazardous waste unless that particular waste has been determined by SRS not to be a hazardous waste. The waste must be accumulated at or near the point of generation and must be under the control of the generator of the waste at all times. **No more than a total of 55 gallons of hazardous waste or one (1) quart of acutely hazardous waste may be accumulated at any one (1) location. If you exceed these limits, you must mark each container with the date that these limits were exceeded and contact SRS immediately to arrange for removal of all waste within three (3) calendar days.** (For the definitions of Hazardous Waste and Acutely Hazardous Waste, see www.epa.gov >hazardous waste >u list or >p list, respectively.)

2. The waste must be placed in containers made or lined with materials which will not react with, and are otherwise compatible with, the waste to be stored so that the ability of the container to contain the waste is not impaired. The original chemical container can serve as a waste container. Chemical Hygiene staff will provide you with containers at no cost, if necessary.

3. With the exception of unwanted uncontaminated chemicals in the original manufacturer's bottle, all waste containers must be labeled using SRS's Waste Management Label (see Attachment C). This label must include the full name of each chemical constituent and the amount and concentration of each chemical constituent added to the container. If the exact products of a chemical reaction are not known, label the container with the reactants and the products of which you are aware. These labels are available at no cost through your Building Coordinator or SRS.

4. All containers of waste must be closed at all times during accumulation and storage, except when it is necessary to add or remove waste.

5. All containers must not be opened, handled or stored in such a manner that may rupture the container or cause it to leak.

6. If a container of waste is not in good condition or if it begins to leak, the generator must transfer the waste from this container to a container that is in good condition. If there is a spill or leak of a chemical, consult SRS's Chemical Spill Response Program (SRS Manual Section 4.02). Never leave a spill or leak without somehow preventing other people from entering the area. Also, get help if the spill is on you.

7. The generator must inspect areas where containers are stored, at least weekly, looking for leaks and for deterioration caused by corrosion or other factors. Appropriate corrective action must then be taken by the generator, if necessary.

8. All inappropriately labeled or unlabeled chemical containers must be properly identified before you transfer within or terminate employment from the University. This prevents the costly problem of questionable or unidentified chemicals that require testing for hazard qualities prior to transportation and disposal. You will also need to arrange to have your waste or surplus chemicals picked up by SRS while you are still in control of the chemicals and available at the pickup site.

9. Incompatible wastes must not be placed in the same container. Waste must not be placed in an unwashed container that previously held an incompatible waste. A storage container of waste that is incompatible with any other material or waste that is stored nearby must be separated from these other materials or wastes or protected from them by either a secondary containment device (e.g., plastic tray, plastic pan, plastic bucket) or other device (e.g., wall, dike). **NOTE: The purpose of this is to prevent fires, explosions, gaseous emissions, leaching or other discharge of waste which could result from the mixing of incompatible wastes or materials if the containers break or leak.**

In the examples below, the mixing of Group A material with Group B material may have the potential consequence as noted:

Group A	Group B	Consequence
Acids	Bases (alkaline materials)	Heat generation; violent reaction
Aluminum, Beryllium, Calcium, Lithium, Magnesium, Potassium, Sodium, Zinc powder, other reactive metals and metal hydrides	Acids and bases	Fire or explosion; generation of flammable hydrogen gas

Alcohols	Concentrated acids or bases	Fire, explosion, or heat; generation of flammable or toxic gases
Water	Calcium, Lithium, Metal hydrides, Potassium, Sulfuryl chloride, Thiony chloride, Phosphorus trichloride, Dimethyl silicone, other water reactive materials	Fire, explosion, or heat generation; generation of flammable or toxic gases
Alcohols	Concentrated acids or bases	Fire, explosion or violent reactions
Aldehydes, halogenated hydrocarbons, nitrated hydrocarbons, unsaturated hydrocarbons, other reactive organic compounds and solvents	Aluminum, Berylium, Calcium, Lithium, Magnesium, Potassium, Sodium, Zinc powder, other reactive metals and metal hydrides	Fire, explosion or violent reactions
Chlorates	Organic acids	Fire, explosion or violent reaction
Chlorine	Concentrated mineral acids	Generation of toxic gas
Cyanide and Sulfide solutions	Acids	Generation of toxic hydrogen cyanide or hydrogen sulfide gas
Hypochlorites, Nitrates, fuming Nitric acid, Perchlorates, Permanganates, Peroxides, other strong oxidizers	Other flammable and combustible materials	Fire, explosion or violent reactions

10. ***Empty Containers.*** A container which formerly held a regulated hazardous waste (except for acutely hazardous wastes) is considered empty if no more than 3% by weight of the total capacity of the container remains in the container if the container is 119 gallons or less in size (0.3% if greater than 119 gallons). If the container held an acutely hazardous waste, the container must be triple rinsed with a solvent capable of removing the waste. The rinsates must then be

disposed as hazardous waste. Alternatively, containers of acutely hazardous chemicals/wastes may be disposed as hazardous waste without being rinsed.

WASTE DISPOSAL

Do not fill the waste container more than three-quarters full. When three-quarters full, the container is ready for pick-up. Complete a Hazardous Material Disposal Request form (see Attachment D). This is a form that is supplied by SRS to be used by all generators of surplus or waste hazardous materials. Route the completed form to SRS via campus mail (MSC07 4100), or if urgent, hand carry to SRS or fax it to 277-9006 (note that SRS must have the original before or at the time of pickup). You will be then be contacted by SRS staff to schedule a pickup date and time. These forms are also available through your Building Coordinator or through SRS. Contact SRS at 277-0316, if you have any questions or comments.

G. PENALTIES

Severe civil and criminal penalties can be imposed upon the generator and University for irresponsible and illegal hazardous waste management and disposal practices. Any fines levied upon the University will be allocated to the responsible organizational unit. The procedures listed above have been designed to properly and economically manage UNM's hazardous wastes while complying with all applicable EPA and NMED regulations. SRS is available for advice and technical assistance, and would encourage all generators to contact SRS at 277-0316.

[illegible] *pats.unm.edu/permits.cfm*

[illegible]arking Zones

[illegible] *pats.unm.edu/permits.cfm* [illegible] 277-5176

- Commuter Parking Zone Permit [illegible]
- Commuter Zone Parking Permit become generic at 3:45pm [illegible]

[illegible]etered and Hourly Parking

[illegible]

[illegible]andicapped Parking

[illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

[illegible]estricted Areas

[illegible]

[illegible]nforcement

[illegible]

Key Phone Numbers

- [illegible] 277-0850
- [illegible] 277-1938

Lost and Found

- [illegible] 277-0818
- [illegible] 277-0860
- [illegible] 8:00am - 5:00pm, Monday - Friday

Safety

- [illegible]
- [illegible]
- [illegible]
- [illegible]

Operational Effectiveness

- [illegible]
- [illegible]
- [illegible]
- [illegible]

ALTERNATIVE TRANSPORTATION

Alternative Transportation

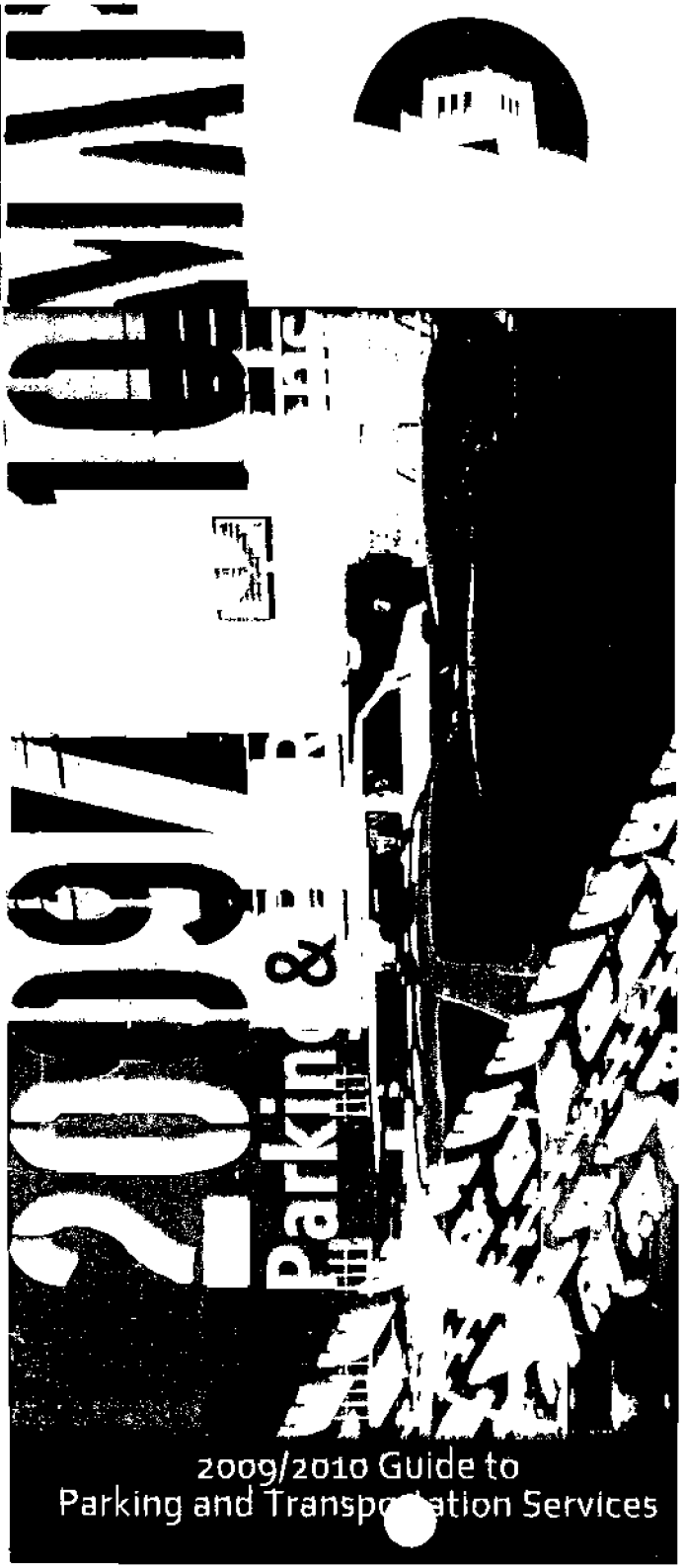
[illegible] 277-0461 [illegible] *pats.unm.edu/alternative-commute*

UNM PATS: WE'RE HERE TO GET YOU THERE

pats.unm.edu

UNM PARKING & TRANSPORTATION

Parking & Transportation Services
Mon-Fri 7:30am-5:00pm | Transportation: 8:00am-5:00pm
Tel: 505-277-1338 Fax: 505-277-1709
Email: parking@parking.unm.edu
Web: pats.unm.edu



The Zone Parking System

Legal Parking Spaces and Areas

Handicapped Parking

Restricted Areas

Metered and Hourly Parking

Hours of Enforcement

Rules Governing Specific Permit Types

Commuter Zone Parking Permits

Commuter zone parking permits become generic at 3:45 pm daily

Residential Zone Parking Permits

Dormitory residents must purchase their permits through the Housing Reservations website housing.unm.edu

Motorcycle Permits

Temporary Permits

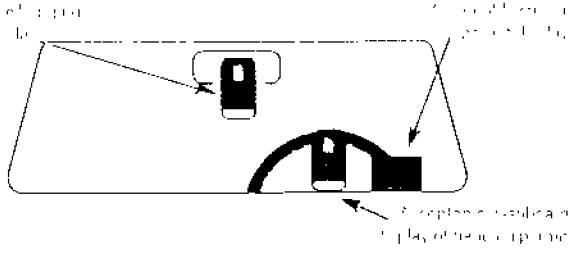
Department Permits

Vendor Permits

Patient Parking Permits

Rover Permits

Permit Ownership and Validity



Fraudulent Permits and Unauthorized Use

Park at Your Own Risk

Purchasing Your Permit

Dormitory Residents

Commuter Students

Faculty and Staff

Permit Refunds and Exchanges

Lost or Stolen Permits

Immobilized and Impounded Vehicles

Appealing a Citation

Payment and Collection of Fines

Mail payments to:

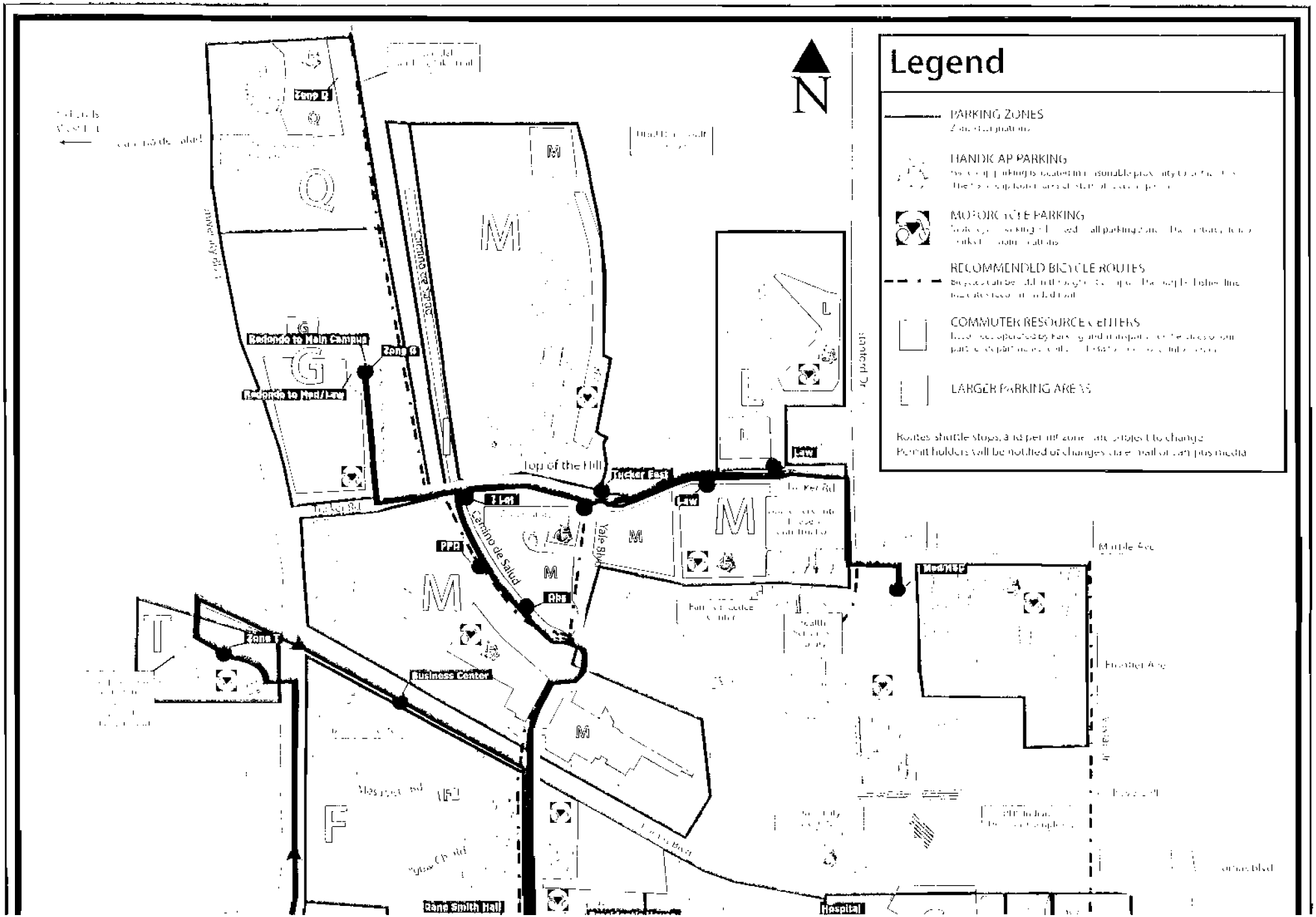
On Campus

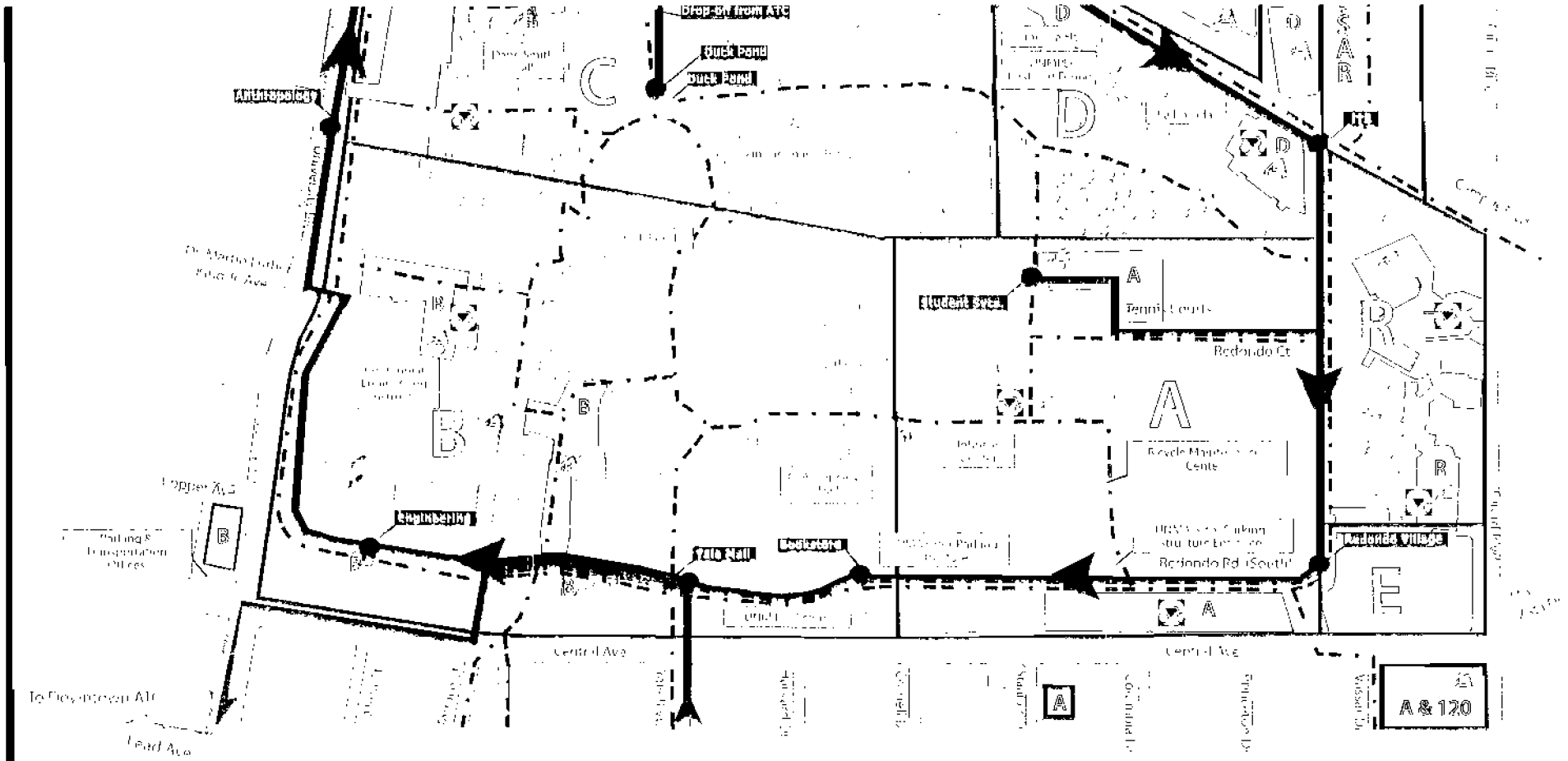
UNM PATS
Citation Payments
1 University of New Mexico
MSC01 1180
Albuquerque, NM 87131-0001

Our location

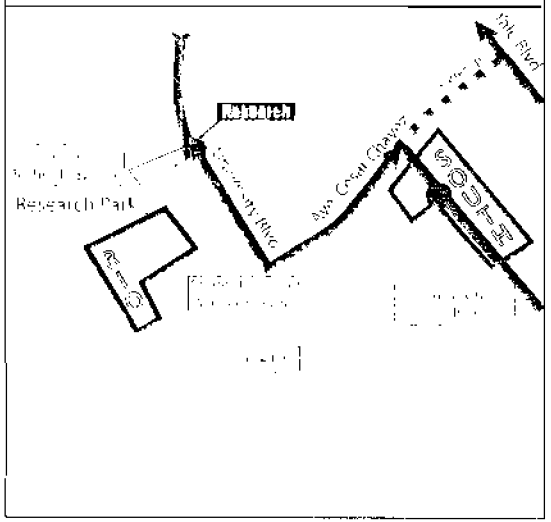
1521 Central Ave. NE
Albuquerque, NM
(NW corner of Central Ave and University Blvd.)

CAMPUS TRANSPORTATION SYSTEM 2009 - 2010





South Campus



Courtesy Shuttle Routes & Stops

BUS STOPS

REDONDO SHUTTLE

G/Q LOT SHUTTLE

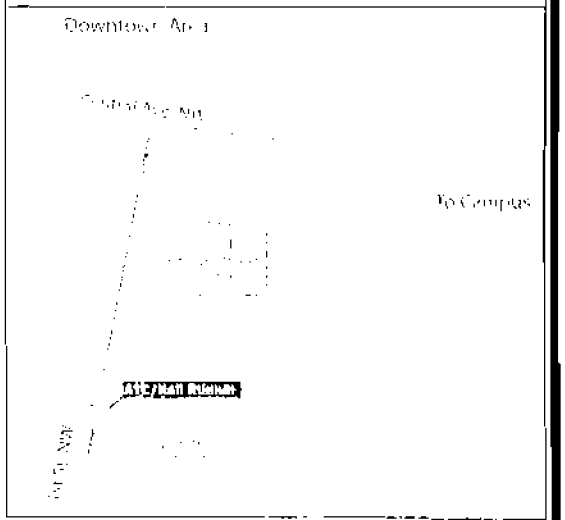
T LOT SHUTTLE

SOUTH LOT SHUTTLE

ATC/RAILRUNNER

UNM HOSPITAL SHUTTLE SERVICES: Call 272 3976

ATC/Rail Runner



APPENDIX H: MAINTENANCE ACITIVITY SCHEDULE AND MARCH INSPECTION LOG

MAINTENANCE ACTIVITY	FREQUENCY
Inspection of basins and ponds	Semi-annually and after every major rainfall event
Mowing of grass filter strips and swales	Weekly during the growing seasons
Grooming/trimming of vegetative filter strips and buffers	Annually or more frequently as needed
Removal of surface litter and debris	Daily
Removal of litter and debris from storm inlets	Spring and fall or as needed
Stabilization and re-vegetation of eroded areas	As needed (immediately)
Vacuuming of all pavements	Twice per week
Pond cleaning and grooming	Annually or more frequently as needed
Storm drain cleaning	Quarterly

Storm Drain No.	Drain Location	Odors	Overflow	Oil/ Hazardous Waste	Gross Pollutants/ Debris	Construction Activity Nearby	Grass/ Leaves/ Animal Waste	Sand/ De-icing Material	Grate Condition	Date	Inspector	WO #	If in poor condition explain
1													
2													
3	Walk	N	N	N	N	N	Y	N	FAIR	3/10/2009	MF		
4	Walk	N	N	N	N	N	Y	N	FAIR	3/10/2009	MF		
5	Walk	N	N	N	Y	N	Y	N	FAIR	3/10/2009	ME		
6	Walk	N	N	N	N	N	N	N	FAIR	3/10/2009	ME		
7	Walk	N	N	N	N	N	N	N	FAIR	3/10/2009	ME		
8	Walk	N	N	N	N	N	N	N	FAIR	3/10/2009	MF		
9	Walk	N	N	N	N	N	N	N	FAIR	3/10/2009	MF		
10	Walk	N	N	N	N	N	N	N	FAIR	3/10/2009	ME		
11	Walk	N	N	N	N	N	N	N	FAIR	3/10/2009	ME		
12	Walk	N	N	N	N	N	N	N	FAIR	3/10/2009	ME		
13													
14	Walk	N	N	N	N	N	N	N	FAIR	3/10/2009	ME		
15	Walk	N	N	N	N	N	N	N	FAIR	3/10/2009	ME		
16	Walk	N	N	N	N	N	N	N	FAIR	3/10/2009	MF		
17	Walk	N	N	N	N	N	N	N	FAIR	3/10/2009	ME		
18	Walk	N	N	N	N	N	N	N	FAIR	3/10/2009	ME		
19	Walk	N	N	N	N	N	Y	N	FAIR	3/11/2009	ME		
20	Walk	N	N	N	N	N	N	N	FAIR	3/11/2009	ME		
21	Walk	Y	N	N	N	N	N	N	FAIR	3/11/2009	MF		
22	Walk	Y	N	N	N	N	N	N	FAIR	3/11/2009	ME		
23	Walk	Y	N	N	N	N	N	N	FAIR	3/11/2009	ME		
24													
25	Curb	Y	N	N	N	N	N	N	FAIR	3/11/2009	MF		
26	Walk	N	N	N	N	N	Y	N	FAIR	3/11/2009	ME		
27	Curb	Y	N	N	Y	Y	Y	N	FAIR	3/11/2009	ME		
28	Curb	Y	N	N	Y	Y	Y	N	FAIR	3/11/2009	ME		
29													
30													
31	Bare Ground	N	N	N	N	N	N	N	FAIR	3/11/2009	ME		
32	Walk	N	N	N	N	N	N	N	FAIR	3/11/2009	ME		
33	Walk	N	N	N	N	N	N	N	FAIR	3/11/2009	ME		
34	Walk	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
35	Walk	N	N	N	N	N	N	N	FAIR	3/12/2009	MF		

Storm Drain No.	Drain Location	Odors	Overflow	Oil/ Hazardous Waste	Gross Pollutants/ Debris	Construction Activity Nearby	Grass/ Leaves/ Animal Waste	Sand/ De-icing Material	Grate Condition	Date	Inspector	WO #	If in poor condition explain
36	Walk	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
37	Walk	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
38	Walk	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
39	Walk	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
40	Walk	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
41										3/12/2009	ME		
42	Curb	N	N	N	N	Y	N	N	FAIR	3/12/2009	ME		
43	Curb	N	N	N	N	Y	N	N	FAIR	3/12/2009	ME		
44													
45													
46													
47													
48													
49	Turf	N	N	N	N	N	Y	N	FAIR	3/12/2009	ME		
50	Turf	N	N	N	N	N	Y	N	FAIR	3/12/2009	ME		
51	Turf	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
52	Turf	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
53	Turf	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
54	Turf	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
55	Walk	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
56	Walk	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
57	Walk	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
58	Walk	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
59										3/12/2009	ME		
60	Walk	N	N	N	N	N	N	N	FAIR	3/12/2009	ME		
61													
62													
63													
64													
65													
66													
67													
68	Bare Ground	N	N	N	N	N	Y	N	FAIR	3/13/2009	ME		
69	Curb									3/13/2009	ME		
70	Curb									3/13/2009	ME		

Storm Drain No.	Drain Location	Odors	Overflow	Oil/ Hazardous Waste	Gross Pollutants/ Debris	Construction Activity Nearby	Grass/ Leaves/ Animal Waste	Sand/ De-icing Material	Grate Condition	Date	Inspector	WO #	If in poor condition explain
71													
72													
73													
74													
75													
76													
77													
78													
79													
80													
81													
82	Curb	N	N	N	Y	N	Y	N	GOOD	3/13/2009	ME		
83	Curb	N	N	N	N	N	N	N	GOOD	3/13/2009	ME		
84	Curb	N	N	N	N	N	N	N	GOOD	3/13/2009	ME		
85	Curb	N	N	N	N	N	N	N	GOOD	3/13/2009	ME		
86										3/13/2009	ME		
87	Curb	N	N	N	N	N	N	N	GOOD	3/13/2009	ME		
88	Curb	N	N	N	N	N	N	N	GOOD	3/13/2009	ME		
89	Curb	N	N	N	N	N	N	N	GOOD	3/13/2009	ME		
90	Walk	N	N	N	Y	N	N	N	GOOD	1/14/2008	ME		
91	Walk	N	N	N	N	N	N	N	FAIR	3/16/2009	ME		
92	Walk	Y	N	Y	Y	N	Y	N	FAIR	3/16/2009	ME		
93	Curb	Y	N	Y	Y	N	Y	N	FAIR	3/16/2009	ME		
94													
95													
96	Curb	N	N	N	Y	Y	Y	N	FAIR	3/16/2009	ME		
97	Curb	N	N	N	Y	Y	Y	N	FAIR	3/16/2009	ME		
98	Curb	N	N	N	Y	Y	Y	N	FAIR	3/16/2009	ME		
99	Curb	N	N	N	Y	Y	Y	N	FAIR	3/16/2009	ME		
100													
101													
102	Turf	N	N	N	N	N	N	N	FAIR	3/16/2009	ME		
103	Turf	N	N	N	N	N	N	N	FAIR	3/16/2009	ME		
104	Walk	N	N	N	N	N	N	N	FAIR	3/16/2009	ME		
105	Walk	N	N	N	N	N	N	N	FAIR	3/16/2009	ME		
106	Walk	N	N	N	N	N	N	N	FAIR	3/16/2009	ME		

Storm Drain No.	Drain Location	Odors	Overflow	Oil/ Hazardous Waste	Gross Pollutants/ Debris	Construction Activity Nearby	Grass/ Leaves/ Animal Waste	Sand/ De-icing Material	Grate Condition	Date	Inspector	WO #	If in poor condition explain
107	Walk	N	N	N	N	N	N	N	FAIR	3/16/2009	ME		
108	Walk	N	N	N	N	N	N	N	FAIR	3/16/2009	ME		
109	Walk	N	N	N	N	N	N	N	FAIR	3/16/2009	ME		
110	Walk	N	N	N	N	N	N	N	FAIR	3/16/2009	ME		
111	Walk	N	N	N	N	N	N	N	FAIR	3/16/2009	ME		
112													
113													
114													
115													
116													
117	Curb	N	N	N	N	N	N	N	GOOD	3/16/2009	ME		
118	Curb	N	N	N	N	N	N	N	GOOD	3/16/2009	ME		
119	Curb	N	N	N	Y	N	Y	N	GOOD	3/16/2009	ME		
120	Curb	N	N	N	Y	N	N	N	GOOD	3/16/2009	ME		
121	Curb	Y	N	N	Y	N	Y	N	FAIR	3/16/2009	ME		

Storm Drain No.	Drain Location	Odors	Overflow	Oil/ Hazardous Waste	Gross Pollutants / Debris	Construction Activity Nearby	Grass/ Leaves/ Animal Waste	Sand/ De-icing Material	Grate Condition	Date	Inspector	WO #	If in poor conditio n explain
1										3/23/2009	EB		
2	Walk	N	N	N	N	N	Y	Y	FAIR	3/23/2009	EB		
3										3/23/2009	EB		
4										3/23/2009	EB		
5	Walk	N	N	N	Y	N	Y	Y	GOOD	3/23/2009	EB		
6	Curb									3/23/2009	EB		
7	Curb									3/23/2009	EB		
8	Curb									3/23/2009	EB		
9	Curb									3/23/2009	EB		
10	Walk	N	N	N	N	N	N	N	FAIR	3/23/2009	EB		
11	Walk	N	N	N	Y	N	Y	Y	GOOD	3/23/2009	EB		
12	Walk	N	N	N	N	N	N	N	GOOD	3/23/2009	EB		
13	Walk	N	N	N	N	N	N	N	GOOD	3/23/2009	EB		
14	Walk	N	N	N	N	N	Y	Y	POOR	3/23/2009	EB		
15	Walk	N	N	N	N	N	Y	Y	GOOD	3/23/2009	EB		
16	Curb	N	N	N	N	N	Y	Y	GOOD	3/23/2009	EB		
17	Walk	Y	N	N	N	N	Y	Y	GOOD	3/23/2009	EB		
18	Walk	N	N	N	Y	N	Y	N	GOOD	3/23/2009	EB		
19	Walk	N	N	N	Y	N	N	Y	GOOD	3/23/2009	EB		
20	Bare Ground	N	N	N	N	N	N	N	GOOD	3/23/2009	EB		
21	Walk	Y	Y	Y	Y	N	Y	Y	GOOD	3/23/2009	EB		
22	Walk	N	N	N	N	N	N	N	GOOD	3/23/2009	RM		
23	Walk	N	N	N	N	N	N	N	GOOD	3/23/2009	RM		
24	Walk	N	N	N	N	N	N	N	POOR	3/23/2009	RM		
25	Walk	N	N	N	N	N	N	N	POOR	3/23/2009	RM		
26	Walk	N	N	N	N	N	Y	N	POOR	3/23/2009	RM		
27	Walk	N	N	N	N	N	N	N	POOR	3/23/2009	RM		
28	Walk	N	N	N	N	N	N	N	POOR	3/23/2009	RM		
29	Walk	N	N	N	N	N	N	N	POOR	3/23/2009	RM		
30										3/24/2009	RM		
31										3/24/2009	RM		
32	Bare Ground	N	N	N	N	N	N	N	POOR	3/24/2009	RM		

33	Turf	N	N	N	N	N	N	N	FAIR	3/24/2009	RM
34	Walk	N	N	N	N	N	N	N	GOOD	3/24/2009	RM
35	Walk	N	N	N	N	N	N	N	GOOD	3/24/2009	RM
36	Walk	N	N	N	N	N	N	N	GOOD	3/24/2009	RM
37	Walk	N	N	N	Y	N	N	N	GOOD	3/24/2009	RM
38	Walk	N	N	N	N	N	N	N	GOOD	3/24/2009	RM
39										3/24/2009	
40									FAIR	3/24/2009	RM
41	Walk	N	N	Y	N	N	N	N	FAIR	3/24/2009	RM
42	Wak	N	N	N	N	N	N	N	GOOD	3/24/2009	RM
43	Turf	Y	N	N	Y	N	N	N	GOOD	3/24/2009	RM
44		N	N	N	N	N	N	N	GOOD	3/24/2009	RM
45	Walk	N	N	N	N	N	N	N	GOOD	3/24/2009	RM
46	Walk	N	N	N	N	N	N	N	GOOD	3/24/2009	RM
47	Walk	N	N	N	N	N	N	N	GOOD	3/24/2009	RM
48	Walk	N	N	N	N	N	Y	N	GOOD	3/24/2009	RM
49	Walk	N	N	N	N	N	Y	N	GOOD	3/24/2009	RM
50	Walk	N	N	N	N	N	N	N	FAIR	3/24/2009	RM
51	Walk									3/24/2009	RM
52	Walk	N	N	N	N	N	N	N	FAIR	3/24/2009	RM
53										3/24/2009	RM
54										3/24/2009	RM
55										3/24/2009	RM
56										3/24/2009	RM
57										3/24/2009	RM
58										3/24/2009	RM
59	Walk	N	N	N	N	N	N	N		3/24/2009	RM
60	Walk	N	N	N	N	N	N	N		3/24/2009	RM
61	Walk	N	N	N	N	N	N	N		3/24/2009	RM
62	Walk	N	N	N	N	N	N	N		3/24/2009	RM
63										3/24/2009	
64	Walk	N	N	N	N	N	N	N	GOOD	3/24/2009	RM
65	Walk	N	N	N	N	N	N	N	GOOD	3/24/2009	RM
66	Walk	N	N	N	N	N	N	N	GOOD	3/24/2009	RM
67										3/24/2009	RM
68	Walk	N	N	N	N	N	N	N		3/25/2009	RM
69	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM

70	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
71	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
72	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
73	Walk	N	N	N	N	N	N	N	POOR	3/25/2009	RM
74	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
75	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
76	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
77	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
78	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
79	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
80	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
81	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
82	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
83	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
84	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
85	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
86	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
87	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
88	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
89	Walk	N	N	N	N	N	N	N	GOOD	3/25/2009	RM
90	Walk	N	N	N	N	N	N	N	GOOD	3/25/2009	RM
91	Walk	N	N	N	N	N	N	N	GOOD	3/25/2009	RM
92	Walk	N	N	N	N	N	N	N	GOOD	3/25/2009	RM
93	Walk	N	N	N	N	N	N	N	GOOD	3/25/2009	RM
94	Walk	N	N	N	N	N	N	N	GOOD	3/25/2009	RM
95	Walk	N	N	N	N	N	N	N	GOOD	3/25/2009	RM
96	Walk	N	N	N	N	N	N	N	GOOD	3/25/2009	RM
97	Walk	N	N	N	N	N	N	N	GOOD	3/25/2009	RM
98	Walk	N	N	N	N	N	N	N	GOOD	3/25/2009	RM
99	Walk	N	N	N	N	N	N	N	FAIR	3/25/2009	RM
100	Walk	N	N	N	N	N	N	N	FAIR	3/26/2009	RM
101	Walk	N	N	N	N	N	N	N	FAIR	3/26/2009	RM
102										3/26/2009	RM
103										3/26/2009	RM
104										3/26/2009	RM
105	Walk	N	N	N	N	N	N	N	FAIR	3/26/2009	RM
106										3/26/2009	RM

107	Walk	N	N	N	N	N	N	N	FAIR	3/26/2009	RM
108	Walk	N	N	N	N	N	N	N	FAIR	3/26/2009	RM
109	Walk									3/26/2009	RM
110	Walk									3/26/2009	RM
111	Walk									3/26/2009	RM
112	Walk	N	N	N	N	N	N	N	GOOD	3/26/2009	RM
113										3/26/2009	RM
114	Walk	N	N	N	N	N	N	N	GOOD	3/26/2009	RM
115	Walk	N	N	N	N	N	N	N	GOOD	3/26/2009	RM
116										3/26/2009	RM
117										3/26/2009	RM
118	Walk	N	N	N	N	N	N	N	FAIR	3/26/2009	RM
119	Walk	N	N	N	N	N	N	N	FAIR	3/26/2009	RM
120										3/26/2009	RM
121	Walk									3/26/2009	RM
122	Walk									3/26/2009	RM
123	Walk									3/26/2009	RM
124	Walk									3/26/2009	RM
125	Walk									3/26/2009	RM
126	Walk									3/26/2009	RM
127	Walk									3/26/2009	RM
128	Walk									3/26/2009	RM
129	Walk									3/26/2009	RM
130										3/26/2009	RM
131	Walk	N	N	N	N	N	N	N	FAIR	3/26/2009	RM
132										3/26/2009	RM
133	Walk	N	N	N	N	N	N	N	FAIR	3/26/2009	RM
134										3/26/2009	RM
135	Walk	N	N	N	N	N	N	N	FAIR	3/26/2009	RM
136	Walk	N	N	N	N	Y	N	N	FAIR	3/26/2009	RM
137	Walk	N	N	N	N	Y	N	N	FAIR	3/26/2009	RM
138	Turf	N	N	N	N	Y	N	N	FAIR	3/26/2009	RM
139	Turf	N	N	N	N	Y	N	N	FAIR	3/27/2009	RM
140	Walk	N	N	N	N	Y	N	N	FAIR	3/27/2009	RM
141	Bare Ground	N	N	N	N	Y	N	N	FAIR	3/27/2009	RM
142	Slope	Y	N	N	N	N	N	N	FAIR	3/27/2009	RM
143	Walk	N	N	N	N	N	N	N	FAIR	3/27/2009	RM

144	Walk	N	N	N	N	N	N	N	FAIR	3/27/2009	RM
145	Walk	N	N	N	N	N	N	N	FAIR	3/27/2009	RM
146										3/27/2009	RM
147										3/27/2009	RM
148										3/27/2009	RM
149										3/27/2009	RM
150	Turf									3/27/2009	RM
151	Bare Ground	Y	N	N	Y	N	N	N	GOOD	3/27/2009	RM
152	Curb	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
153	Curb	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
154										3/27/2009	RM
155										3/27/2009	RM
156										3/27/2009	RM
157	Slope	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
158	Slope									3/27/2009	RM
159	Walk	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
160	Walk	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
161	Walk	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
162	Walk	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
163	Walk	N	N	N	N	N	N	Y	GOOD	3/27/2009	RM
164	Walk	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
165	Walk	Y	N	N	Y		Y	Y	GOOD	3/27/2009	RM
166	Walk/Slope									3/27/2009	RM
167	Slope	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
168	Walk									3/27/2009	
169	Walk									3/27/2009	
170	Walk	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
171	Walk	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
172	Curb	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
173	Walk	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
174	Bare Ground	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
175	Slope	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
176	Yard									3/27/2009	RM
177										3/27/2009	RM
178	Walk	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
179	Walk				Y					3/27/2009	RM
180	Walk				Y					3/27/2009	RM

181	Walk	N	N	N	Y	N	N	N	GOOD	3/27/2009	RM
182	Walk	N	N	N	Y	N	N	N	GOOD	3/27/2009	RM
183	Walk	Y	N	N	N	N	N	N	GOOD	3/27/2009	RM
184	Walk	Y	N	Y	N	N	N	N	GOOD	3/27/2009	RM
185	Walk	Y	N	Y	N	N	N	N	GOOD	3/27/2009	RM
186										3/27/2009	RM
187	Walk	Y	N	N	N	N	N	N	GOOD	3/27/2009	RM
188	Walk	N	N	N	N	N	N	N	GOOD	3/27/2009	RM
189	Walk	N	N	N	N	N	N	N	GOOD	3/27/2009	RM

December 21, 2004

Chuck Carnes, Senior Engineer
Public Works Department, Hydrology Division
400 Marquette, NW
Albuquerque, NM 87102

RE: UNM SWMP's 11/30/04 Update Copies Transmittal

Dear Chuck:

As you requested, enclosed are three copies of UNM's Storm Water Management Program that were recently updated on 11/30/04. We are still pursuing UNM's storm water expenditure information that you also requested.

Thank you for assembling the annual report to the EPA from all the committees. If you have related questions or comments, please contact me directly at 277-9758.

Vernon Hirshberger, CHMM
Environmental Health Manager

cc: Larry Wilson, Biological, Chemical & Environmental Officer Manager

[illegible]

[illegible] — Director — gave @ last Staff Mtg

[illegible] — Director — "

GIL — Assoc D — "

JEFF Z — Assoc D. — "

GARY — Assoc D. — "

HARVEY — Assoc D — gave @ 12/1/04 Jt. Staff Mtg

DON — Assoc. D. — "

BRUCE DAHLQUIST — Director

MIKE McGUIRE — Director

MARY KENNEY — Assoc Director — gave to 2 personal EMTs

X TRA

SHSA

✓ Rick Howard — in person gave 2, w/ EMPLD + Atlanta 12/3/04 and 4 pocket EMTs

✓ Andy Boatwright — in person gave 1, " 11/30/04

JEFF MORTENSEN + ASSOCIATES, INC.
6010-B MIDWAY PARK BLVD. N.E.
ALBUQUERQUE, NEW MEXICO 87109
ENGINEERS SURVEYORS (505) 345-4250
FAX (505) 345-4254 ESTABLISHED 1977

TRANSMITTAL

TO: Vern Hershberger
University of New Mexico
Safety Health & Environmental Affairs

DATE: December 8, 2004

FROM: Jennifer L. Anaya

PROJECT: UNM NPDES MS4 PERMIT

JMA JOB NO: 2004-174.1

VIA: ☒ Delivery ☐ Pickup ☐ US Mail ☐ Federal Express Overnight Delivery

WE ARE SENDING:

QTY.	DESCRIPTION	FOR
1	Municipal Separate Storm Sewer System	Your Use

REMARKS:

Please call if you have any questions.

FAX TRANSMITTAL

PLEASE DELIVER THE FOLLOWING PAGES AS SOON AS POSSIBLE TO:

JEFF NORTHRUP

THIS FAX IS FROM: ABBY MATSON

Safety, Health & Environmental Affairs
MSC07 4160
1 University of New Mexico
Albuquerque, NM 87131-0001
505 277-2753 Phone
505 277-0013 Fax

DATE: 11/24/98 TIME: 7:12 PM

TOTAL NUMBER OF PAGES INCLUDING COVER SHEET: 4

COMMENTS: JEFF

THANKS FOR YOUR HELP TODAY FOR UNM'S HELPLESS PERSON!

HAPPY THANKSGIVING!

ABBY

If there is any problem with this transmission, please call 505 277-2753

Hard copy to follow? ___ Yes X No

From: Larry Watson <lwatson@unm.edu> on 11/24/2004 4:02 PM -0700
To: Jeff Mortenson <jeffmunma@swcp.com>
CC: Vernon Hershberger <hershber@unm.edu>
Subject: UNM's SWMP COMPONENT #3A - Record of Maintenance Inspection

Gentlemen:

Please report the following and let me know if you disagree with anything. I have also given each of you a memo copy from Gary Smith.

NORTH PARKING LOT DETENTION
Inspection History: Inspected November 24, 2004
Maintenance Record: No maintenance required at this time

SHEA/SHUTTLE LOT SETTLING BASIN
Inspection History: Inspected November 24, 2004
Maintenance Record: No maintenance required at this time

OBSERVATORY PARKING LOT SANITARY INLETS
Inspection History: Not applicable since it is currently under construction.
Maintenance Record: Not applicable since it is currently under construction.

FORD DETENTION
Inspection History: November 24, 2004
Maintenance Record: No maintenance required at this time

TERRACE PEDESTRIAN MALL
Inspection History: Inspected November 24, 2004
Maintenance Record: No maintenance required at this time.

YALE PEDESTRIAN MALL
Inspection History: Inspected November 30, 2004
Maintenance Record: No maintenance required at this time.

DANE SMITH HALL
Inspection History: Inspected November 24, 2004
Maintenance Record: No maintenance required at this time

TENNIS BUBBLE PARKING LOT
Inspection History: Inspected November 24, 2004
Maintenance Record: No maintenance required at this time.

EAST FOOTBALL STADIUM LOT
Inspection History: Inspected November 24, 2004
Maintenance Record: No maintenance required at this time

Larry Watson, CHMM

Biological, Chemical, and Environmental Affairs Manager
Environmental Affairs, Industrial Hygiene, and Recycling Division

From: Larry Watson <lwatson@unm.edu> on 11/24/2004 4:00 PM -0700
To: Jeff Monenson <jeffmima@swcp.com>
CC: Vernon Hershberger <hershber@unm.edu>
Subject: UNM's SWMP COMPONENT #3A - Record of Maintenance Inspection

Department of Risk Management/Safety, Health, and Environmental Affairs
MSC07 4100 - 1 University of New Mexico
Albuquerque, NM 87131-0001

Phone: (505) 277-5486
Fax: (505) 277-9006
Pager: (505) 951-0307
Email: lwatson@unm.edu

The University of New Mexico

Physical Plant Department
Programmed Services of
Albuquerque, NM 87131-5800
Telephone (505) 277-2421
Fax (505) 277-1230

Memorandum

November 24, 2004

TO: Vernon Hershberger, Environmental Health Manager, SHEA

THRU: Dr. Gary Smith, PhD, Associate Director, PPD

SUBJECT: Storm Water Quality Facilities

Please note the following inspection report for selected storm water quality facilities.

North Parking Lot Detention – Inspected daily for gross pollutants, inspected quarterly for structural integrity. This detention was reinforced on the west side in September 2002.

SHEA Smith (or South) Grove – Inspected daily for gross pollutants. Maintenance is performed as necessary. No maintenance necessary at this time.

Yard Detention – 60" pipe. Inspection performed on 11-24-04. No maintenance required at this time.

Terrace Pedestrian Mall – 60" pipe. Inspection performed on 11-24-04. No maintenance required at this time.

Main Pedestrian Mall – 36" pipe. Unable to access either south or north facility. Scheduled for Dec. 2004.

Dane Smith – 72" pipe. Inspection performed on 11-24-04. No maintenance required at this time.

2001.171.1

Willie Dodge
Grounds Supervisor

The University of New Mexico

Mailing Address:
MSC05 4200
1 University of New Mexico
Albuquerque NM 87131-0001

Shipping Address:
1001 Lomas Blvd NE
Albuquerque NM 87131
Phone: (505) 277-1761
Fax: (505) 277-7091
Cell: (505) 249-7301
Email: wdodge@unm.edu

LARRY – MET w/ WILLIS DODGE @ 5 CAMPUS. I WATCHED AS HE INSPECTED THE TENNIS BUBBLE PARKING LOT WQ INLET & S. FOOTBALL STADIUM PARKING LOT DETENTION POND. THE WQ INLET REQUIRES PUMPING & SEDIMENT REMOVAL. THE FOOTBALL LOT IS RELATIVELY CLEAN; SOME FLOATABLES IN NORTH INLET

JEFF

[illegible]

MS4 Permit 12/1/04 Deadline Assignment List

SWMP Component #	Primary Work By	Review By	Certification By
1.a. SWMP Document	JMA	Vern	NA
2.a. SWMP Document	JMA - [illegible]	Vern	NA
3.a. Structural Controls	JMA - i.e. SW features' [illegible]	Vern	NA
	Vern - Develop I&M form [illegible]	Larry	NA
3.b. Structural Controls - I&M Program	JMA w/ - Gary S. input	Vern	NA
5. Roadways - Litter Control Program	Larry w/ input Gary S. [illegible]	Larry	NA
7.a. Pesticide Applic. - Certif. Impl. Pest. Prog	Larry w/ input Gary's [illegible]	Larry	EVP Harris
8.a. Illicit Discharges	JMA - [illegible]	Vern	NA
9.a. Illicit Overflows/Infiltration - sewer survey	JMA [illegible]	Vern	NA
12.a. Illicit Discharge Insp/Elimin. Prog	Vern w/ existing doc from JMA	Larry	NA
13.a. Spill Prevent'n & Response Prog	Vern w/ existing doc from JMA	Larry	NA
14.a. Impact'd & High Risk Runoff Prog [illegible]	Vern w/ ~~existing doc from~~ JMA	Larry	NA
15.a. Construct'n Runoff Prog	JMA w/ ~~input from~~ [illegible]	Vern	NA
15.b. Certify Operator Ed. Prog	Vern [illegible]	Larry	EVP Harris
16.a. Public Ed. Prog	Larry w/ existing doc from JMA	Vern	NA
17.a. Floatables - Eval. Trash Reduct'n Needs	JMA w/ input from Gary S. Scott Dotson of Athletics and Randy Hisey of Golf	Vern	NA
17.b. Floatables Monitoring Program	JMA w/ input from Gary S.	Vern	NA
20.a. Update Roles & Resp of Committees	~~Vern w/ Gruber & Lerer~~	Larry	
21.a. Dev'l Operation & Maint. Program [illegible]	Larry w/ input from Gary, Harvey, Scott Dotson, Randy Hisey	Larry	NA

[illegible]

[illegible]

★ Get JMA Fulfillment MM copy.

[illegible] to get Talbott info from Gary S. [illegible]

Storm Water Run-Off
Inspection/Maintenance Report
1st Quarter - 2004

Storm Drain #:

Drain Location:

Curb

Walk

Turf

Slope

Bare Ground

Odors:

Yes

No

Overflow:

Yes

No

Oil/Hazardous Waste:

Yes

No

Gross Pollutants/Debris:

Yes

No

Construction Activity Nearby:

Yes

No

Grass/Leaves/Animal Waste:

Yes

No

Sand/De-icing Material:

Yes

No

Grate Condition:

Good

Fair

Poor

Storm Water Run-Off
Inspection/Maintenance Report
1st Quarter - 2004

Storm Drain #

Inspection Date

Inspector Initials:

Work Order Generated:

Yes (Work Order #)

No

If drain is in poor condition, need detailed explanation. (example: Drain pipe needs to be cleared or snaked/Grate cover damaged/etc.)

Storm Drain #

Storm Drain #

Storm Drain #

Storm Drain #

Storm Drain #

Storm Drain #

Storm Drain #

Storm Drain #

Storm Drain #

Storm Drain #

Supervisor:

Signature

Printed Name

Date:

APPENDIX I: ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The University of New Mexico

Safety, Health and Environmental Affairs
1801 Tucker Street NE
Building 233
Albuquerque, NM 87131-3510
Telephone (505) 277-2753
FAX (505) 277-9000

MEMORANDUM

DATE: May 16, 2005

TO: David W. Harris, Executive Vice President for Administration

FROM: Donna K. Smith, Director, Risk Management & SHEA

SUBJECT: **Signatures Needed on EPA Storm Water Permit Required Certifications**

The EPA issued a National Pollutant Discharge Elimination System (NPDES) Permit #NM000101 to UNM for the University's municipal separate storm sewer system (MS4) as required by the Clean Water Act. This permit requires certification of the implementation of both UNM's Illicit Discharge Inspection/Elimination Program, and UNM's Spill Prevention & Response Program. Assuming your commitment to sufficient funding and staffing, these programs will be implemented as part of UNM's required storm water pollution prevention (SWP2) efforts.

These program certifications are due to EPA by June 1, 2005. SHEA intends to send a package to EPA's Region Six Office in Dallas, Texas, by May 27, 2004. When finished, please contact Larry Watson at 7-5488, or Vern Hershberger at 7-9756 for prompt pickup. Someone from SHEA will then promptly pick it up for copying & distribution.

University Counsel has already reviewed this. If you require edits, please contact me at 7-9794, or Vern Hershberger at 7-9756 at your earliest opportunity.

Thank you for your help on this important project.

Cc: Vernon Hershberger, Environmental Health Manager
Dr. Gary Smith, Associate Director, Environmental Services, PPD
Larry Watson, Manager, Biological, Chemical & Environmental Affairs

CONTRACT REVIEW FORM
Last Revised: 12/08/99

The employee initiating the contract should complete the appropriate sections of this form, and send it with the contract to the appropriate contract review officer for processing (see reverse side for the location of contract review officers). To the extent the initiating employee does not understand the proposed contract, or is uncomfortable with any of its provisions, he or she should note that information on the Contract Review Form or attach an explanatory memo.

Certificate of University Employee Initiating Contract

Parties to the Contract: ***U.S. Environmental Protection Agency (EPA) and University of New Mexico (UNM)***

Date: ***May 11, 2005***

Short Description: ***UNM certification on implementation of both an Illicit Discharge Inspection/Elimination Program and a Spill Prevention and Response Program as required by UNM's NPDES storm water permit from EPA.***

Contract Term: ***Indefinite*** Amount: ***No immediate direct costs, but RSHEA will need increased support to perform work required.***

Except as indicated in any attached memorandum, I have read this contract entirely, understand all its provisions, believe that it meets programmatic and UNM mission requirements, believe that it represents a good deal for the University, and take responsibility for complying with the terms of the contract. The document is internally consistent and clear. I am also satisfied with the description of the University's obligations and with the description of any goods or services to be provided by or to the University. Any risk management concerns have been reasonably addressed. A memorandum (_ is __ is not attached. To the extent the contract requires an outlay of funds, the funds are available. I either have the authority to obligate the funds or have attached approval from someone who does.

Compliance with this contract will require the cooperation of, or otherwise impact on, the following departments or positions:

Risk Management/Safety, Health & Environmental Affairs (RSHEA)

Physical Plant Department (PPD)

5/13/05 Vernon Hershberger *Environmental Health Manager*
Date *Signature Vernon Hershberger*

Dean (Academic) or Director (Staff) Certificate (if above party is not a Dean or Director)

I concur with the above certification:

5-16-05 *Director, RSHEA*
Date *Signature Dolan Smith*

Contract Review Officer Review

I have reviewed this contract and it does not contain any legally prohibited provisions, includes all legally or administratively required provisions, is basically consistent and clear, and is not otherwise objectionable on legal or administrative grounds, to the best of my knowledge and abilities. I have indicated below any other reviews necessary prior to execution of this contract.

University Counsel Emeritus
Date *Signature* ~~[illegible]~~ Nick Estes

___ **Recommend Additional Review (see page 2)**

ILLICIT DISCHARGE INSPECTION/ELIMINATION PROGRAM

for

STORMWATER POLLUTION PREVENTION AT UNM

Preface

The University of New Mexico (UNM) endeavors to be a good neighbor to our community and the natural environment. To that end, UNM strives for proactive and cost-effective solutions to minimize impacts to our campus community and neighbors.

Consistent with those goals, UNM continues to educate and train internal staff on storm water pollution prevention (SWP2) techniques and requirements. UNM employs outside contractors and design professionals who are already proficient with incorporating SWP2 into their work for UNM.

The following attempts to document UNM's ongoing and evolving SWP2 efforts regarding the discovery and elimination of illicit discharges. As desired by all involved, including the EPA, this program is not cast-in-stone, and will be periodically modified in order to allow for future improvements.

I. Investigation of Potential Illicit Discharges

The Albuquerque UNM campuses are all located upstream of City of Albuquerque (COA) monitoring stations. UNM participates through a cooperative agreement with COA, Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) and the New Mexico Dept. of Transportation (NMDOT) co-permittees in a Stormwater Monitoring and Testing Program. Therefore, UNM storm water discharges continue to be regularly monitored and sampled for illicit discharges.

Risk Mgmt R

UNM's Department of Safety, Health & Environmental Affairs (SHEA) oversees the environmental, health and safety (EH&S) issues at UNM. If SHEA is notified about or self discovers indications of potential illicit discharges, then on-site investigative work will begin within 2 hours. A process for contacting SHEA staff on a 24-hours per day basis continues to be available via the UNM Police Department.

As part of the Dry Weather and Wet Weather Screening Programs, SHEA staff will also continue to periodically observe flows randomly for odors or other visual indications of potentially illicit discharges at various municipal separate storm sewer system (MS4) locations on campus.

II. Elimination of Illicit Discharges

If the presence of an illicit discharge to UNM's MS4 is confirmed by SHEA, then SHEA will endeavor to find the source of that illicit discharge, stop the discharge and clean up the discharges as quickly as possible.

Upon confirmation of any significant illicit discharge, within 2 hours SHEA will notify the COA Department of Municipal Development Hydrology Division NPDES Coordinator and/or AMAFCA, depending on discharge location. If the illicit discharge could potentially negatively impact the Rio Grande River, SHEA staff will also contact the New Mexico Environment Department (NMED) and/or the EPA within 2 hours of confirmation. If the illicit discharge source cannot be immediately found and stopped with the efforts of UNM's internal staff, SHEA will promptly request assistance from outside agencies, such as Rinchem Chemical, Inc., or the Albuquerque Fire Dept.

III. PROGRAM IMPLEMENTATION CERTIFICATION

I am an authorized representative, as described in Appendix G, Subsection 11 of the NPDES General Permit.

I certify that the University of New Mexico (UNM) will continue to implement the Discharge Inspection/Elimination Program as described above. To continue to improve the efficiency and effectiveness of this relatively new program, UNM anticipates changes to it periodically in the future. All such changes will be compliant with NPDES regulations and consistent with storm water pollution prevention goals.

I certify under penalty of law that this program and attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____ _____

David W. Harris — Date

Executive Vice President for Administration

APPENDIX J: UPDATED NOI LIST

TRACKING NUMBER	NOI SUBMITTED DATE	DATE OF COVERAGE	APPLICATION TYPE	ORGANIZATION_NAME	PROJECT NAME	PROJECT COUNTY	PROJECT CITY	STATUS	ORIGIN
NMLEW0310	December 22, 2005	December 29, 2005	Low Erosivity Waiver	FLINTCO WEST, INC	UNM WAREHOUSE, UNM CAMBUS SOUTH	Bernalillo	ALBUQUERQUE	Active	NOI Center
NMLEW0413	July 25, 2006	July 25, 2006	Low Erosivity Waiver	GENERAL ACRYLICS INC	UNIVERSITY OF NEW MEXICO TRACK	Bernalillo	ALBUQUERQUE	Active	NOI Center
NMLEW0500	March 20, 2007	March 20, 2007	Low Erosivity Waiver	FLINTCO WEST, INC	UNM RCI BULDG. DEMOLITION	Bernalillo	ALBUQUERQUE	Active	NOI Center
NMLEW0574	October 26, 2007	October 26, 2007	Low Erosivity Waiver	BRYAN CORPORATION	DEMO BLDG 154	Bernalillo	ALBUQUERQUE	Active	NOI Center
NMLEWGK72	May 12, 2009	May 12, 2009	Low Erosivity Waiver	Bradbury Stamm Construction	UNM - Mitchell Hall Modernization	Bernalillo	Albquerque	Active	eNOI
NMR10GA63	December 04, 2008	December 11, 2008	Construction	JAYNES CORPORATION	UNM College of Education Addit	Bernalillo	Albuquerque	Active	eNOI
NMR10GC89	January 05, 2009	January 12, 2009	Construction	FLINTCO, INC	UNM Rio Rancho Campus	Sandoval	Rio Rancho	Active	eNOI
NMR10GK83	May 14, 2009	May 26, 2009	Construction	CORONADO WRECKING	UNM Lot C Parking Structure Site	Bernalillo	Albuquerque	Terminated Certified	eNOI
NMR10GL56	June 11, 2009	June 18, 2009	Construction	AUI INC	UNM SRC Utility Infrastructure	Bernalillo	Albuquerque	Active	eNOI
NMR10GM36	July 07, 2009	July 14, 2009	Construction	McCarthy BuildingCompanies	UNM Science and Math Learning Center	Bernalillo	Albuquerque	Active	eNOI
NMR10GM79	July 16, 2009	July 23, 2009	Construction	FLINTCO INC	UNM RIO RANCHO CAMPUS	Sandoval	RIO RANCHO	Active	NOI Center
NMR15D292	December 16, 2003	December 23, 2003	Construction	JB HENDERSON CONSTRUCTION	PETE AND NANCY DOMENICI HALL	Bernalillo	ALBUQUERQUE	Active	eNOI
NMR15DJ38	July 20, 2004	July 29, 2004	Construction	UNIVERSAL CONSTRUCTORS	UNM ROTC PARKING LOT	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15DJ80	July 30, 2004	August 06, 2004	Construction	UNM TRAFFIC & PARKING SERVICES	UNM OBSERVATORY PARKING LOT	Bernalillo	ALBUQUERQUE	Active	NOI Center
NMR15DJ81	July 30, 2004	August 06, 2004	Construction	UNIVERSAL CONSTRUCTION	UNM OBSERVATORY PARKING LOT	Bernalillo	ALBUQUERQUE	Terminated Certified	NOI Center
NMR15DJ83	July 30, 2004	August 06, 2004	Construction	UNIVERSAL CONSTRUCTORS	NORTH TUCKER PARKING LOT	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15DK15	August 05, 2004	August 12, 2004	Construction	UNM TRAFFIC & PARKING SERVICES	NORTH TUCKER PARKING LOT	Bernalillo	ALBUQUERQUE	Active	NOI Center
NMR15DK18	August 05, 2004	August 12, 2004	Construction	UNM TRAFFIC & PARKING SERVICES	UNM ROTC PARKING LOT	Bernalillo	ALBUQUERQUE	Active	NOI Center
NMR15DK19	August 05, 2004	August 12, 2004	Construction	UNIVERSAL CONSTRUCTORS	UNM TRAFFIC & PARKING SERVICES	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI

TRACKING NUMBER	[illegible]	DATE OF [illegible]	TYPE	ORGANIZATION NAME	FACILITY	[illegible]	[illegible]	STATUS	ORIGIN
NMR15DK22	August 05, 2004	August 12, 2004	Construction	UNIVERSAL CONSTRUCTORS	UNM TRAFFIC & PARKING SERVICES	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15DN74	August 25, 2004	September 01, 2004	Construction	UNHM FACILITY PLANNING	UNM LANDS WEST PARKING LOT	Bernalillo	ALBUQUERQUE	Active	NOI Center
NMR15DT54	October 12, 2004	October 19, 2004	Construction	UNM HSC FACILITY PLANNING	HSC RESEARCH/EDUCATION	Bernalillo	ALBUQUERQUE	Active	NOI Center
NMR15DT66	October 12, 2004	October 19, 2004	Construction	JACK B. HENDERSON	UNM CHILDRENS HOSPITAL	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15DU46	October 21, 2004	October 28, 2004	Construction	JAYNES CORPORATION	UNM CHILDREN'S HOSPITAL	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15DU90	October 28, 2004	November 04, 2004	Construction	AJAC ENTERPRISES INC	BOSQUE WILDFIRES, PHASE IV	Bernalillo	ALBUQUERQUE	Active	NOI Center
NMR15DV98	November 12, 2004	November 19, 2004	Construction	KHANI COMPANY	7.5 ACRES PARKING LOT FOR UNMH	Bernalillo	ALBUQUERQUE	Terminated Certified	NOI Center
NMR15DW51	November 19, 2004	November 26, 2004	Construction	RMCI, INC	UNM CONCRETE BOX CULVERT	Bernalillo	ALBUQUERQUE	Terminated Certified	NOI Center
NMR15E421	March 15, 2005	March 22, 2005	Construction	MOUNTAIN WEST GOLFSCAPES INC	UNM SOCCER PRACTICE FIELDS	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15ED64	July 18, 2005	July 25, 2005	Construction	FLINTCO WEST, INC	UNM HEALTH SCIENCES CENTER	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15EI50	September 21, 2005	September 28, 2005	Construction	FLINTCO WEST, INC	UNM FIELD STATION PH 1	Socorro	ACACIA	Terminated Certified	eNOI
NMR15EM38	November 15, 2005	November 22, 2005	Construction	JAYNES CORPORATION	UNM SCHOOL OF ARCHITECTURE	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15EV35	March 22, 2006	March 29, 2006	Construction	ENTERPRISE BUILDERS CORP	UNM VALENCIA CAMPUS	Valencia	LOS LUNAS	Terminated Certified	eNOI
NMR15EV43	March 23, 2006	March 30, 2006	Construction	UNIVERSITY OF NEW MEXICO	UNM VALENCIA CAMPUS	Valencia	LOS LUNAS	Terminated Certified	eNOI
NMR15EW91	April 12, 2006	April 19, 2006	Construction	FLINTCO WEST, INC	UNM INSTRUCT BLDG.	Taos	TAOS	Terminated Certified	eNOI
NMR15F335	July 07, 2006	July 14, 2006	Construction	SALLS BROTHERS CONSTRUCTION IN	AUTUNM VIEW	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15F448	July 31, 2006	August 07, 2006	Construction	UNIVERSITY OF NEW MEXICO	UNM SOUTH GOLF COURSE	Bernalillo	ALBUQUERQUE	Terminated Certified	NOI Center
NMR15F666	August 24, 2006	August 31, 2006	Construction	ALBUQUERQUE ASPHALT, INC	UNM SOUTH GOLF COURSE	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI

TRACKING NUMBER	NOI SUBMITTED DATE	DATE OF COVERAGE	APPLICATION TYPE	ORGANIZATION NAME	PROJECT NAME	PROJECT COUNTY	PROJECT CITY	STATUS	ORIGIN
NMR15F708	August 31, 2006	September 07, 2006	Construction	JAYNES CORPORATION	UNM GALLUP HEALTH CAREERS II B	Mckinley	GALLUP	Terminated Certified	eNOI
NMR15F880	October 05, 2006	October 12, 2006	Construction	BRADBURY STAMM CONSTRUCTION	UNM CENTENNIAL ENGINEERING BUI	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15F896	November 30, 2006	December 07, 2006	Construction	A.S. HORNER, INC	NEW MEXICO TRI- LAB BUILDING	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15FH69	March 27, 2007	April 03, 2007	Construction	JAYNES CORPORATION	UNM - INDOOR PRACTICE FACILITY	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15FM88	June 29, 2007	July 06, 2007	Construction	FLINTCO WEST, INC	UNM CANCER CENTER	Bernalillo	ALBUQUERQUE	Active	NOI Center
NMR15FO34	July 31, 2007	August 07, 2007	Construction	WESTWIND LANDSCAPE	UNM SOFTBALL FIELD PHASE IIB	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15FO90	August 09, 2007	August 16, 2007	Construction	BRADBURY STAMM CONSTRUCTION	RIB EXPANSION BUILDING	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15FP62	August 20, 2007	August 27, 2007	Construction	U. S. ELECTRICAL CORP	LANDS WEST UTILITY EXPANSION	Bernalillo	ALBUQUERQUE	Terminated Certified	eNOI
NMR15FR70	October 09, 2007	October 16, 2007	Construction	FLINTCO WEST, INC	UNM- EARLY CHILDCARE CENTER	Taos	TAOS	Active	eNOI
NMR15FS29	October 25, 2007	November 01, 2007	Construction	RMCI, INC	UNM HSC ROUNDABOUT- ROADWAY ENTRY	Bernalillo	ALBUQUERQUE	Terminated Certified	NOI Center
NMR15FU96	January 14, 2008	January 21, 2008	Construction	FLINTCO, INC	UNM SEVILLETA FIELD STATION II	Socorro	SOCORRO	Terminated Certified	NOI Center
NMR15FY41	March 14, 2008	March 21, 2008	Construction	ALBUQUERQUE ASPHALT INC	UNM Lands West	Bernalillo	Albuquerque	Terminated Certified	eNOI
NMR15FY50	March 18, 2008	March 25, 2008	Construction	U. S. ELECTRICAL CORP	UNM HSC CRTC II	Bernalillo	Albuquerque	Terminated Certified	eNOI
NMR15FY72	March 25, 2008	April 01, 2008	Construction	BRADBURY STAMM CONSTRUCTION	UNM Neurobiology Research	Bernalillo	Albuquerque	Terminated Certified	eNOI
NMR15G130	June 04, 2008	June 11, 2008	Construction	AUI INC	University of New Mexico	Bernalillo	Albuquerque	Terminated Certified	eNOI
NMR15G170	June 11, 2008	June 18, 2008	Construction	JAYNES CORPORATION	UNM Health Sciences Phase II	Bernalillo	Albuquerque	Active	eNOI
NMR15G193	June 17, 2008	June 24, 2008	Construction	BRADBURY STAMM CONSTRUCTION	NM COURT OF APPEALS ANNEX	Bernalillo	ALBUQUERQUE	Active	eNOI
NMR15G243	June 26, 2008	July 03, 2008	Construction	BRADBURY STAMM CONSTRUCTION	UNM SE HEIGHTS CENTER OF FAMIL	Bernalillo	ALBUQUERUQUE	Terminated Certified	eNOI

TRACKING NUMBER	[illegible]	[illegible]	[illegible] TYPE	[illegible]	[illegible]	[illegible]	PROJECT CITY	STATUS	[illegible]
NMR15G324	March 25, 2008	April 01, 2008	Construction	UNIV. OF NEW MEXICO REGENTS	DOMENICI CTR FOR HS ED BUILDING	Bernalillo	ALBUQUERQUE	Active	NOI Center
NMR15G349	June 11, 2008	July 20, 2008	Construction	UNIV. OF NEW MEXICO REGENTS	NEUROBIOLOGY ADDITION	Bernalillo	ALBUQUERQUE	Active	NOI Center

APPENDIX K: FIELD SCREENING SAMPLE LOG

NPDES – STORM WATER

FIELD SCREENING SAMPLE LOG

SAMPLE LOCATION _____

SAMPLE DATE _____ TECHNICIAN _____

FIELD OBSERVATIONS

WEATHER CONDITIONS

☐ Sunny ☐ Windy Temp (F deg.) _____

☐ Partly Cloudy ☐ Overcast

☐ Rain ☐ Other _____

Estimated Flow (CFS) _____

SAMPLE APPEARANCE

☐ Clear Color _____

☐ Turbid Odor _____

☐ Oil Sheen Observed Gross Pollutants _____

FIELD TESTS

pH _____ Total Conductance _____

Dissolved Oxygen _____ Water Temp (F deg) _____

COMMENTS: _____

_____

_____

APPENDIX L: OUTFALL LISTS AND UNM BASINS

EXISTING DRAINAGE BASIN SUMMARY

BASIN	CAMPUS	AREA (AC)	OUTFALL	DEVELOPMENT STATUS	STRUCTURAL CONTROL	DOWNSTREAM WATER QUALITY MONITORING STATION
N-1	NORTH	11.0	N/A (CLOSED BASIN)	UNDEV		N/A
N-2	NORTH	28.6	HANNETT AVE. NE	FULLY DEV		UR9900 (USGS)
N-3.1	NORTH	123.3	N. DIVERSION CHANNEL	PARTIALLY DEV	N. DIVERSION CHANNEL BOX CULVERT	UR9900 (USGS)
N-3.2	NORTH	1.1	N. DIVERSION CHANNEL	PARTIALLY DEV		UR9900 (USGS)
N-4	NORTH	7.6	N/A (CLOSED BASIN)	FULLY DEV		N/A
N-5.1	NORTH	8.9	LOMAS BLVD. NE	FULLY DEV		UR400B (COA)
N-5.2	NORTH	1.8	LOMAS BLVD. NE	FULLY DEV.		UR400B (COA)
N-5.3	NORTH	11.7	LOMAS BLVD. NE	FULLY DEV		UR400B (COA)
N-6	NORTH	5.8	MARBLE AVE. NE	FULLY DEV.		UR9900 (USGS)
N-7.1	NORTH	25.9	UNIVERSITY BLVD. NE	FULLY DEV	NORTH PARKING LOT DETENTION FACILITY	UR400B (COA)
N-7.2	NORTH	11.7	UNIVERSITY BLVD. NE	FULLY DEV		UR400B (COA)
M-1	MAIN	31.6	LOMAS BLVD. NE	FULLY DEV		UR400B (COA)
M-2	MAIN	97.8	N. DIVERSION CHANNEL	FULLY DEV		UR9900 (USGS)
M-3.1	MAIN	2.0	UNIVERSITY BLVD. NE	FULLY DEV		UR500 (USGS)
M-3.2	MAIN	58.7	UNIVERSITY BLVD. NE	FULLY DEV	FORD DETENTION FACILITY YALE PEDESTRIAN MALL DETENTION FACILITY	UR200 (USGS)
M-4	MAIN	1.6	N/A (CLOSED BASIN)	FULLY DEV		N/A
M-5.1	MAIN	1.7	CENTRAL AVE.	FULLY DEV		UR200 (USGS)
M-5.2	MAIN	1.3.9	CENTRAL AVE.	FULLY DEV		UR200 (USGS)
M-5.3	MAIN	9.8	CENTRAL AVE.	FULLY DEV		UR200 (USGS)
M-5.4	MAIN	10.3	CENTRAL AVE.	FULLY DEV.		UR200 (USGS)
S-1	SOUTH	9.4	UNIVERSITY BLVD. SE	FULLY DEV		UR200 (USGS)
S-2.1	SOUTH	8.4	AVENIDA CESAR CHAVEZ SE	FULLY DEV.		UR200 (USGS)
S-2.2	SOUTH	31.2	AVENIDA CESAR CHAVEZ SE	FULLY DEV		UR200 (USGS)
S-2.3	SOUTH	14.9	AVENIDA CESAR CHAVEZ SE	FULLY DEV		UR200 (USGS)
S-3.1	SOUTH	59.5	UNIVERSITY BLVD. SE	FULLY DEV		UR200 (USGS)
S-3.2	SOUTH	2.3	UNIVERSITY BLVD. SE	FULLY DEV		UR200 (USGS)
S-4	SOUTH	72.7	SOUTH DIVERSION CHANNEL	PARTIALLY DEV		UR200 (USGS)

APPENDIX M: COOPERATIVE AGREEMENT FOR SAMPLING

City of Albuquerque

P.O. Box 1293 ALBUQUERQUE, NEW MEXICO 87103

Martin Chavez, Mayor

Department of Public Works
Charles "Ted" Asbury, Director

February 24, 2003

Mr. Larry Watson
University of New Mexico
Safety, Health and Environmental Affairs
1801 Tucker, NE, Bldg. 233
Albuquerque, NM 87131

RE: NPDES Storm Water Sampling/Monitoring Program

Dear Larry:

Attached is you copy of the recently finalized *Cooperative Agreement for Participation in Stormwater Monitoring and Testing*.

If you have any questions, please feel free to contact me.

Charles M. Caruso, P.E.
Hydrology Division

Attachment

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

COOPERATIVE AGREEMENT

FOR

PARTICIPATION IN STORMWATER MONITORING AND TESTING

THIS AGREEMENT is entered into pursuant to NMSA 1978 Sections 67-3-28 and Section [illegible] of the City of Albuquerque Revised Ordinances, 1994, by and between the City of Albuquerque, a New Mexico municipal corporation ("City"), Albuquerque Metropolitan Arroyo Flood Control Authority ("AMAFCA"), a political subdivision of the State of New Mexico, the New Mexico State Highway and Transportation Department ("NMSHTD"), and the University of New Mexico ("UNM"), hereinafter referred to as the "Agencies".

WHEREAS, the U.S. Environmental Protection Agency ("EPA") is requiring National Pollutant Discharge Elimination System ("NPDES") storm water discharge permits for Municipal Separate Storm Sewer Systems ("MS4"), and

WHEREAS, the storm drainage systems of the Agencies are not separate systems and storm water runoff is intermixed within the drainage systems, and

WHEREAS, the Agencies have completed NPDES permit applications individually or as co-permittees, and

WHEREAS, the City is the lead agency in preparation of the yearly progress report to the EPA; and

WHEREAS, the City and AMAFCA have established over thirty (30) monitoring stations for flow measurement and/or water sampling in the major urban drainage basins; and

WHEREAS, the City and AMAFCA have entered into yearly cooperative agreements with the US Geological Survey ("USGS") for the collection and analysis of stormwater samples; and

WHEREAS, pursuant to NMSA 1978 Sections 67-3-28, the Agencies have agreed to participate in the municipal separate storm sewer system application submittal and execution of the forthcoming EPA-NPDES permit.

WHEREAS, the Agencies have entered into an existing Cooperative Agreement, "Existing Agreement" dated January 2000, (City contract No. D09150), wherein the Agencies have agreed to allocate cost-share responsibilities for stormwater monitoring and testing; and

WHEREAS, the Agencies wish to terminate the Existing Agreement and replace it with this Agreement to reallocate the cost share responsibilities for stormwater monitoring and testing.

NOW THEREFORE the Agencies agree as follows:

1. The Existing Agreement is hereby terminated and this Cooperative Agreement shall supersede and replace the Existing Agreement.

2. The purpose of the agreement is for the Agencies to participate in the NPDES storm water discharge permit for the City as co-permittees as defined in the Federal Register Vol. 55, No. 222, final rules for the National Pollutant Discharge Elimination System Permit Application for Storm Water Discharges.

3. The Agencies shall participate in the total cost of the NPDES Monitoring, Testing and Reporting Items of the USGS/City/AMAFCA yearly monitoring agreement mentioned above according to the following schedule.

AGENCY	% Of Total Monitoring, Testing and Reporting Items in USGS yearly Agreement
NMSHTD	12%
AMAFCA	37%
CITY	37%
UNM	12%

4. The cost of monitoring and testing shall be determined annually by the City and AMAFCA, and the City shall annually notify the agencies by letter of such annual cost participation by May 1. The cost shall be shared by the Agencies as set forth above in paragraph 2.

5. Cost participation payments shall be made to the City by UNM and NMSHTD annually, during the month of February.

   UNM and NMSHTD participation shall not exceed $20,000 each annually.

6. Special monitoring and testing and/or water quality requirements that are imposed, via the NPDES permit, upon individual Agencies shall be addressed by the individual system operator. Cost of addressing those special requirements shall be the responsibility of the individual operator.

7. The Agencies will be individually responsible for submittal of storm drainage information to EPA as required by the EPA - NPDES requirements. The City will be responsible to additionally submit required water quality monitoring data per requirements of the MS4 permit.

8. The parties understand and agree that the obligations of the Agencies under this Agreement shall be performed in compliance with all applicable laws, statutes and ordinances. Nothing herein is intended to constitute any agreement for the parties to

perform any activity in violation of the Constitution or Laws of the State of New Mexico or the Ordinance of the City of Albuquerque.

9. Strict accountability shall be required for all funds received and disbursed under the terms of this agreement.

10. This agreement may be amended if done so in writing and approved by the parties herein.

11. This agreement may be terminated by any party by providing sixty (60) days written notice in advance of the termination. In the event of termination, the costs incurred shall be paid by all parties as mutually agreed to for services satisfactorily completed to the date of termination. If the terms and conditions of termination cannot be mutually agreed to, then all parties agree to arbitrate under the New Mexico Uniform Arbitration Act.

12. If any clause or provision in this agreement is illegal, invalid, or unenforceable, under present or future laws effective during the term of this agreement, then and in that event, it is the intention of the parties hereto that the remainder of this agreement shall not be affected thereby.

13. As between the parties hereto, each party shall be responsible for liability arising from the personal injury or damage to person or property occasioned by its own agents or employees in the performance of this agreement, subject in all cases to the immunities and limitations of the New Mexico Tort Claims Act (sections 41-4-1, Et seq., NMSA 1978) and any amendments thereto. This paragraph is intended only to define the liabilities between the parties hereto and it is not intended to modify, in any way, the parties' liabilities as governed by common law or the New Mexico Tort Claim Act.

14. It is specially agreed between the Parties executing this agreement that it is not intended by any of the provisions of any part of agreement to create in the public, or any member thereof, a third party beneficiary or to authorize anyone not a party to the agreement to maintain a suit(s) for wrongful death(s), bodily and/or personal injury(ies) to person(s), damage(s) to property(ies), and/or any other claim(s) whatsoever pursuant to the provisions of this agreement.

15. By entering into this agreement, the Parties hereto and its "public employees," as defined in the New Mexico Tort Claims Act, do not waive sovereign immunity, do not waive any defense(s) and/or do not waive any limitation(s) of liability and/ or waives any provision of the New Mexico Tort Claims Act.

16. That all parties to this agreement are expressly not committed to expenditure of any funds until such time as they are budgeted, appropriated by their respective public bodies, and approved for expenditure. Each party's decision as to whether its funds are sufficient for fulfillment of this agreement shall be final.

17. Any funds remaining after the purposes of this agreement have been accomplished will be returned to the parties in proportion to their contribution.

IN WITNESS WHEREOF THE PARTIES HAVE EXECUTED THIS AGREEMENT THIS _____ DAY OF _____ 2002

Albuquerque Metropolitan Arroyo
Flood Control Authority

_____ _____
John P. Kelly, P.E. Date
Executive Engineer

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on _____, 2002 by John Kelly, Executive Engineer, on behalf of the Albuquerque Metropolitan Arroyo Flood Control Authority.

OFFICIAL SEAL
MARTIN SENA
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: _____

_____
Notary Public

City of Albuquerque

_____ 2/13/03
Jay Stark Date
Chief Administrative Officer

City of Albuquerque

_____ 2/10/03
Charles "Ted" Asbury, P.E. Date
Director, Public Works Department

Reviewed by City of Albuquerque Legal Department

Assistant City Attorney Date

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on _____, 2012 by Jay Crain, Chief Administrative Officer for the City of Albuquerque, a New Mexico municipal corporation.

Notary Public Expires _____

New Mexico State Highway and Transportation Department

Pete Rahn, Secretary Date

Approved by New Mexico Department of Finance and Administration

N/A

Secretary Date

Approved as to form and legal sufficiency by the New Mexico State Highway and Transportation Department's Office of General Counsel:

Assistant General Counsel Date

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on [illegible]
2002 by [illegible] for the New Mexico State Highway and Transportation Department.

Notary Public

OFFICIAL SEAL
Laura Elizabeth Lopez
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires [illegible]

University of New Mexico

Date

Vice President for Business and Finance

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on [illegible]
2002 by [illegible] on behalf of the Regents of the University of New Mexico.

Notary Public

APPENDIX N: MAJOR SAMPLING LOCATIONS

Selected Critical Monitoring Points

- San Jose Drain @ Woodward
- Broadway Pond Inflow Channel
- Menaul Pond Inflow Channel (Representative of NMDOT inflow)
- Barelas Pumping Plant Inflow
- Kirtland Channel @ South Diversion Channel
- San Antonio Arroyo @ USGS gage
- Calabacillas Arroyo @ Rio Grande
- Hahn Arroyo @ Carlisle
- Embudo Arroyo @ Pennsylvania
- **Highland System Outfall @ UNMH (Representative of UNM Inflow)**
- Bear Canyon Arroyo @ North Diversion Channel
- South Pino Arroyo @ Washington
- North Pino Arroyo @ North Diversion Channel
- South Domingo Baca Arroyo @ Washington
- Amole del Norte Channel @ Blake Rd.
- West Bluff Outfall @ Rio Grande
- Snow Vista Arroyo @ Sage Rd.

APPENDIX O: FIVE MAJOR OUTFALL DESCRIPTIONS

Table 5.1.1.b - Representative Monitoring Outfall Descriptions

OUTFALL	SITE NO.	LOCATION	DESCRIPTION	RESPONSIBLE PERMITTEE
[illegible]	[illegible]	[illegible]	Station located on concrete lined channel. Drain approx. [illegible] sq mi. Land use is [illegible]% residential, [illegible]% commercial, [illegible]% [illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible] [illegible]% agricultural, [illegible]% commercial, [illegible]% mainstreet, [illegible]% residential, [illegible]% open space	[illegible]
[illegible]	[illegible]	Sol [illegible] Drain at Woodward Road at Albuquerque (USGS Station No. 08330200)	Station located on concrete lined channel. Drain approx. 2 sq mi. Land use is 42% residential, [illegible]% commercial, 18% agricultural, [illegible]% mainstreet, 25% open space	Albuquerque [illegible]
[illegible]	[illegible]	[illegible] Albuquerque Lat Station [illegible] Albuquerque (USGS Station No. [illegible])	Station located on NOB Water pollution stations. Combined drainage of [illegible] sq mi. Land use is 35% residential, 32% commercial, 12% open space, 10% industrial, 6% agricultural	Albuquerque [illegible]
[illegible]	[illegible]	Mariposa Diversion at San Antonio Arroyo at Albuquerque (USGS Station No. 08330875)	Station located on natural unlined channel. Drain approx. [illegible] sq mi. Land use is [illegible]% agricultural, [illegible]% industrial, [illegible]% residential, [illegible]% commercial, [illegible]% open space	Albuquerque [illegible]

APPENDIX P: EPA TABLES FOR SAMPLING

Table 5.1.1.a.(1) - Representative Monitoring Annual Requirements: Outfalls 001 - 005 [3]

PARAMETERS [1]	REPORT FOR EACH MONITORING PERIOD (each sample type)			SAMPLE TYPE(S)		MONITORING FREQUENCY
	Minimum	Average	Maximum	Grab	Composite	
1. Dissolved Oxygen (DO) (mg/l)	Yes	Yes		Yes		[illegible] events wet season, 1 event/ dry season
2. Biochemical Oxygen Demand (BOD_5) (mg/l)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
3. Chemical Oxygen Demand (COD) (mg/l)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
4. Total Suspended Solids (TSS) (mg/l)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
5. Total Dissolved Solids (TDS) (mg/l)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
6. Total Nitrogen (mg/l)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
7. Total Kjeldahl Nitrogen (TKN) (mg/l)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
8. Total Phosphorus (mg/l)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
9. Dissolved Phosphorus (mg/l)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
10. Total Cadmium (ug/l) (*MAL 1 ug/l*)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
11. Dissolved Cadmium (ug/l) (*MAL 1 ug/l*)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
12. Total Copper (ug/l) (*MAL 0.5 ug/l*)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
13. Dissolved Copper (ug/l) (*MAL 0.5 ug/l*)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
14. Total Lead (ug/l) (*MAL 0.5 ug/l*)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
15. Dissolved Lead (ug/l) (*MAL 0.5 ug/l*)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
16. Total Zinc (ug/l) (*MAL 20 ug/l*)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
17. Dissolved Zinc (ug/l) (*MAL 20 ug/l*)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
18. Mercury (ug/l) (*MAL 0.005 ug/l*)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
19. Chromium III (ug/l) (*MAL 10 ug/l*)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season
20. Chromium VI (ug/l) (*MAL 10 ug/l*)		Yes	Yes		Yes	[illegible] events wet season, 1 event/ dry season

PARAMETERS [1]	REPORT FOR EACH MONITORING PERIOD (each sample type)			SAMPLE TYPE(S)		MONITORING FREQUENCY
	Minimum	Average	Maximum	Grab	Composite	
21. Arsenic (ug/l) (*MAL 0.5 ug/l*)		Yes	Yes		Yes	2 events/ wet season, 1 event/ dry season
22. Thallium (ug/l) (*MAL 0.5 ug/l*)		Yes	Yes		Yes	2 events/ wet season; 1 event/ dry season
23. Chlorides (as Cl) (mg/l)		Yes	Yes		Yes	2 events/ wet season, 1 event/ dry season
24. Nitrate (mg/l)		Yes	Yes		Yes	2 events/ wet season, 1 event/ dry season
25. pH (S.U.)	Yes		Yes	Yes		2 events/ wet season, 1 event/ dry season
26. Sulfates (mg/l)		Yes	Yes		Yes	2 events/ wet season 1 event/ dry season
27. Conductivity (micromho/cm)		Yes	Yes	Yes		2 events/ wet season, 1 event/ dry season
28. Fecal Coliform (colonies/100 ml)		Yes	Yes	Yes [6]		4 events/ wet season ; Minimum of 2 events quarter during dry season [2]
29. E Coli		Yes	Yes	Yes [6]		4 events/ wet season ; Minimum of 2 events quarter during dry season
30. Oil and Grease (mg/l)		Yes	Yes	Yes		2 events/ wet season, 1 event/ dry season
31. Total Phenols (ug/l)		Yes	Yes		Yes	2 events/ wet season, 1 event/ dry season
32. Hardness (as $CaCO_3$) (mg/l)	Yes	Yes	Yes	Yes		2 events/ wet season; 1 event/ dry season
33. Temperature (F C)	Yes	Yes	Yes	Yes		2 events/ wet season, 1 event/ dry season

2 Seasonal monitoring periods are Wet Season, June 1 through September 30 Dry Season October 1 through May 31

3 Monitoring frequency for each year for Outfalls 001-005 Monitoring for Outfalls 001-005 to commence on the effective date of this permit.

4 If any individual analytical test result is less than the minimum analytical level (MAL) listed for that parameter, then a value of zero (0) may be used for that test result for the discharge monitoring report (DMR) calculations and reporting requirements The annual report **shall include** the actual value obtained, if test result is less than the MAL

5 Monitoring results for bacteria shall also be submitted with the Annual TMDL Progress Report required in Table 3 B 1
Bacteria Loadings for each outfall shall be estimated and reported in the Annual TMDL Progress Report

6 May consist of multiple grab weighted for an event mean concentration

Table 5.1.1.a.(2) - Representative Monitoring Bi-Annual Requirements[6]: Outfalls 001 - 005

VOLATILE COMPOUNDS	MQL µg/L	EPA METHOD
Benzene	[illegible]	[illegible]
Bromoform	[illegible]	[illegible]
Carbon Tetrachloride	[illegible]	[illegible]
Chlorobenzene	[illegible]	[illegible]
Chlorodibromomethane	[illegible]	[illegible]
Chloroethane	[illegible]	[illegible]
2-Chloroethylvinyl ether	[illegible]	[illegible]
Chloroform	[illegible]	[illegible]
1,1-Dichloroethane	[illegible]	[illegible]
1,2-Dichloroethane	[illegible]	[illegible]
1,2-Dichloropropane	[illegible]	[illegible]
1,3-Dichloropropylene	[illegible]	[illegible]
Ethylbenzene	[illegible]	[illegible]
Methyl Bromide [Bromomethane]	[illegible]	[illegible]
Methyl Chloride [Chloromethane]	[illegible]	[illegible]
Methylene Chloride	[illegible]	[illegible]
1,1,2,2-Tetrachloroethane	[illegible]	[illegible]
Toluene	[illegible]	[illegible]

PESTICIDES	MQL µg/L	EPA METHOD
Aldrin	[illegible]	[illegible]
Alpha-BHC	[illegible]	[illegible]
Beta-BHC	[illegible]	[illegible]
Gamma-BHC (Lindane)	[illegible]	[illegible]
Delta-BHC	[illegible]	[illegible]
Chlordane	[illegible]	[illegible]
4,4'-DDT	[illegible]	[illegible]
4,4'-DDE (p,p-DDX)	[illegible]	[illegible]
4,4'-DDD (p,p-DDD)	[illegible]	[illegible]
Dieldrin	[illegible]	[illegible]
Alpha-endosulfan	[illegible]	[illegible]
Beta-endosulfan	[illegible]	[illegible]
Endosulfan sulfate	[illegible]	[illegible]
Total PCBs	[illegible]	[illegible]

BASE/NEUTRAL COMPOUNDS	MQL µg/L	EPA METHOD
Acenaphthene	[illegible]	[illegible]
Acenaphthylene	[illegible]	[illegible]
Anthracene	[illegible]	[illegible]
Benzo(a)anthracene	[illegible]	[illegible]
Benzo(a)pyrene	[illegible]	[illegible]
3,4-Benzofluoranthene	[illegible]	[illegible]
Benzo(k)fluoranthene	[illegible]	[illegible]
Benzo(ghi)perylene	[illegible]	[illegible]
Bis(2-Chloroethoxy)methane	[illegible]	[illegible]
Bis(2-chloroethyl)ether	[illegible]	[illegible]
Bis(2-chloroisopropyl)ether	[illegible]	[illegible]

BASE/NEUTRAL	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[6] Parameters included in Table 5.1.1.a (2) are to be monitored by Albuquerque/AMAFCA biannually (every other year). Seasonal monitoring periods are: Wet Season, June 1 through September 30; Dry Season, October 1 through May 31. Monitoring Frequency is to be 2 events wet season and 1 event dry season using composite sampling. Average and maximum values are to be reported for each monitoring period. Monitoring requirements commence on the effective date of this permit and shall continue on the every other year schedule established by the previous permit.

APPENDIX Q: SPILL PREVENTION PROGRAM

4.02 CHEMICAL SPILL RESPONSE PROGRAM

A. STATEMENT OF PURPOSE

The University of New Mexico (UNM), like any other large and complex academic institution, uses a wide variety of chemicals as a result of its teaching and research activities. The purpose of this program is to ensure rapid, appropriate, and safe response to chemical spills. This program contains requirements for practices designed to protect University faculty, staff, students, volunteers, contractual services employees, visitors and the environment from the hazards of chemical spills that may occur as a result of University-related activities.

This program and the guidelines included in the program are to be followed by all faculty, staff, students, volunteers, and contractual services employees in response to spills of hazardous materials. It is important that the safety of individuals must always be the foremost priority in responding to spills regardless of how insignificant or innocuous the size of spill of any specific hazardous material may seem. This program has been developed in order to identify the procedures to be used for personnel to respond to a chemical spill. In the event of a chemical spill, the individual(s) who caused the spill is (are) responsible for prompt and proper clean-up.
Note: Prevention of chemical spills is the best safety and health strategy.

B. MISSION

To establish the organizational structure and procedures necessary to prevent spills and to minimize the negative impact of chemical spills on UNM facilities, personnel, and the environment.

C. DEFINITIONS

Chemical Spill – Includes, but is not limited to, any unplanned or uncontrolled release of any liquid, semi-solid, solid or gaseous hazardous chemical that can pose a potential safety or health risk to people or the environment.

Facilities - Facilities covered under this program include, but are not limited to, all UNM-owned and all UNM-leased structures and property.

Hazardous Chemical - Any solid, semi-solid, liquid, or gaseous chemical which may pose a recognized physical hazard or a health hazard to humans. This would include, but is not necessarily limited to, the following:

- corrosives (acids, bases)
- paints
- petroleum products (gasoline, diesel fuel, oil, etc.)
- poisons
- oxidizers
- reactives
- solvents (paint thinners, alcohols, etc.)

Health Hazard – Chemicals that may cause various acute or chronic adverse health effects in exposed employees, such that they may be classified as carcinogens, reproductive toxins, sensitizers, hepatotoxins, mutagens, teratogens, nephrotoxins, neurotoxins, etc.

Material Safety Data Sheet (MSDS) - Written or printed material prepared by the manufacturer of a hazardous chemical that contains information about the hazards of the chemical and the appropriate work practices required for safe use and spill cleanup.

Minor Spill - Any hazardous chemical spill that does not involve highly toxic, highly reactive, or explosive chemicals in a situation that is not life threatening. Laboratory personnel can clean up the vast majority of chemical spills that occur in the lab. **The individual(s) who caused the spill, and is most knowledgeable about the spill, is (are) responsible for prompt notification and proper clean-up, when it is safe to do so.** This type of spill should present a manageable physical or health hazard to personnel who, when wearing proper Personal Protective Equipment (PPE), will not be exposed to any chemical at a level that exceeds any recognized OSHA action level or permissible exposure limit.

Major Spill - Any hazardous chemical spill that involves highly toxic, highly reactive, explosive or life-threatening chemicals. Any spill situation presenting significant fire, explosion, physical or health hazard risks during which a person has been significantly exposed, contaminated or injured to such an extent that medical or other outside assistance is required. **Note: If any chemical is present that, when spilled, could present a situation that meets this definition, then emergency procedures for spill response, including cleanup, must be included as part of the workplace's Standard Operating Procedures. Employees should be trained in advance, in preparation for cleaning up large or major spills. Appropriate spill clean-up materials and personal protective equipment must be kept readily available and employees must be trained in their proper utilization.**

Physical Hazard - A hazardous chemical with physical characteristics that make it combustible, explosive, flammable, reactive, a compressed or cryogenic gas, an organic peroxide or an oxidizer.

Training – SRS provides formal "Chemical Safety Officer (CSO)" training, which includes a review of chemical spill response procedures. This training may be requested through the "Learning Central" link that is accessible through SRS's website located at **www.srs.unm.edu**, in addition to access to the Basic Annual Safety Training module and other required OSHA training in accordance with specific and individual position descriptions. All personnel who are not designated as CSO's by their department should be trained by a departmental CSO and equipped with personal protective equipment and spill kits to handle the types of spills expected in their work area. If use of a respirator is required, procurement of medical clearance from the Department of Employee Occupational Health Services (or equivalent) and annual respirator fit testing and training through SRS are required.

D. WHAT TO DO IN ORDER TO PREVENT A CHEMICAL SPILL

This chemical spill response program has been developed in order to identify the procedures to be used for UNM personnel to prevent chemical spills, and then if necessary, to respond to a chemical spill. It also specifies the responsibilities of faculty, staff, students, volunteers, and contractual services employees for initial response to an incident in accordance with local, state and federal requirements. **Prevention of chemical spills is the best safety strategy for any work environment**. All personnel are expected to be aware of the potential hazards associated with the chemicals with which they are assigned to work. UNM expects everyone to learn and to utilize safe chemical handling procedures in the workplace, including but not limited to the following concepts and principles:

- Read the material safety data sheets for the chemicals with which you may work;
- Learn the properties of the materials you may work with;
- Maintain a neat and organized work area, and eliminate clutter;
- Study the procedures developed for safe use of the chemicals in your work area;
- Label transfer/secondary containers with the name of the chemical and a hazard warning;
- Keep chemical containers sealed or closed, except when removing or adding contents;
- Know the differences in hazards between concentrated versus diluted corrosive solutions;
- Always add concentrated forms of acid to water, not water to acid;
- Use unbreakable compatible secondary containment to store and move chemicals;
- Properly store corrosives and flammable chemicals in the appropriate labeled cabinets;
- Do not store more than four liters of flammable liquids outside the fire-rated cabinet;
- Dispose of waste and excess chemicals through SRS in a timely manner (consult SRS Manual: Section 4.05 Hazardous Chemical Waste Program);
- Review safe laboratory procedures prior to conducting new experimental procedures;
- Learn about the worst consequences of a dropped container of each chemical you may use;
- Learn the worst case scenario for a spill of the chemicals you use, and plan accordingly;
- Develop and periodically review written procedures for spill response in your department;
- Take reasonable measures to prevent spills;
- Plan how you will react to a spill of any and all of the materials you may use or handle, and that are present in your work area;
- Know what the appropriate clean-up procedures are for the materials you use;
- Know how to turn off equipment, heat sources, electrical panels, etc., in an emergency; and
- Use safe handling procedures and be aware of all potential hazards of the chemicals.

E. WHAT TO DO IN THE EVENT OF A CHEMICAL SPILL

Laboratory personnel can clean up the vast majority of chemical spills that occur in the lab. **The individual(s) who caused the spill, and is most knowledgeable about the spill is (are) accountable for prompt notification and proper clean-up, when it is safe to do so.** It is the responsibility of the supervisor and/or chemical safety officer to have spill control clean-up materials and personal protective equipment, which are appropriate for the chemicals being handled, readily available for emergency use. Laboratory supervisors and chemicals safety officers are also responsible for ensuring that spills are cleaned up as soon as possible.

The types and quantities of hazardous chemical substances used on the UNM campus require planning in order for accidental chemical releases to be handled in a safe manner. The flow chart in Attachment A may be used to plan an appropriate response to any type of spill.

1. Minor Spill

Evaluate the spill situation before making any decisions.

- What chemicals are involved?
- Where is the MSDS for this chemical, and what does it say about spill clean-up?
- Is the appropriate spill kit available?
- Do you need to isolate the spill area (barrier tape, or safety watch)?
- If the chemical is flammable, do you need to turn off any equipment, heat sources, electrical panels, or other potential ignition sources?
- Will you need to notify the Principal Investigator or your supervisor about the spill?
- Is personal protective equipment needed and is it available?
- Will you need to have another person to stand by or assist during the clean-up?
- Will you need to wear a respirator during the clean-up?
- Will you need to wear other protective equipment, such as gloves, face shield, etc.?
- Does the ventilation to the area need to be improved, or the windows opened?
- Will the spill have consequences in other areas and to other people?

Safe clean-up of a spilled chemical may include following one or even several of these guidelines:

- Notify others in the immediate area that a spill has occurred;
- Advise other lab occupants and supervisor of the spill;
- Isolate the area so that nobody unknowingly walks into the contaminated area, by closing doors, posting other individuals at doors or hallways to warn others, barrier tape, etc.;
- Increase area ventilation, if needed, by turning on hoods and opening windows;
- Review the spill clean-up procedures recommended in the chemical's MSDS sheet;
- Procure and open the chemical spill kit, and evaluate the contents;
- Plan the clean-up steps/procedures you will follow;
- Wear protective equipment as needed, including safety goggles or face shield, gloves, Tyvek suit, apron, respirator, and/or long-sleeve laboratory coat;
- Avoid breathing gases, vapors, and/or fumes from the spill;
- Confine spill to small area with absorbent materials;
- Absorb spill with vermiculite, dry sand, kitty litter, absorbent pads or paper towels;
- Acid and base spills should be neutralized prior to clean-up;
- Use the appropriate SRS Spill Response guide in Attachment C;
- Clean up spill area using other appropriate procedures as recommended in the MSDS;
- Collect residue, place in disposal container, and label waste container;
- Decontaminate reusable cleanup supplies such as scoops, rubber boots, etc.;
- Place all contaminated PPE (gloves, Tyvek suits, etc.) into a plastic bag for disposal;
- Restock the chemical spill kit and return it to the normal storage location;
- Contact SRS at 277-2753 for waste pickup and proper disposal;

- In event of personal contamination, remove affected clothing and flush contaminated skin with water for fifteen minutes, and seek medical attention at EOHS (or equivalent); and,
- Complete the Chemical Spill Report Form and forward it to SRS.

2. Major Spills

If an area contains large quantities of any chemical, emergency procedures for spill clean-up must be included as part of the Standard Operating Procedures for that chemical in the UNM workplace.

Employees should be trained in advance, in preparation for cleaning up large or major spills, should these occur. Appropriate spill clean-up materials and personal protective equipment must be kept readily available and employees must be trained in their proper utilization. Otherwise, in the event of a major spill for which personnel are not properly prepared, and particularly if any person has been significantly exposed, contaminated or injured to such an extent that medical or other outside assistance is required, follow the **E.A.R** steps:

Evacuate affected area and close doors;

Alert Campus Police by calling 911 from a campus phone at a safe location, or 277-2241 from a non-campus phone; and,

Remain close to the phone, and near the spill site, until contacted by emergency responders.

Be prepared to provide more information about the spill, and prepare to provide copies of MSDS's. Assist emergency personnel upon arrival.

All 911 calls, dialed on campus phones are answered by a Dispatcher at UNM Campus Police, which is staffed 24-hours/day and 7-days/week. The SRS Duty Officer (emergency pager 951-0194) will be contacted by the Dispatcher in the even of a major chemical spill. The SRS Duty Officer will then alert other appropriate member(s) of the SRS staff.

In the event of a major chemical spill, SRS personnel will work with Campus Police, AFD-HazMat and on-site personnel as follows:

- Assessing the nature and extent of the chemical spill with assistance from appropriate personnel from the spill location;
- Evacuating and securing the affected area of the chemical spill with assistance from appropriate personnel from the spill location;
- Removing injured personnel and transporting them to appropriate medical facilities;
- Containing the chemical spill;
- Maintaining perimeter control while responsible personnel clean up the spill; and,
- Notifying the New Mexico State Police, if appropriate.

The New Mexico State Police, as directed in the New Mexico State Emergency Management Act, has overall authority over all HazMat events and will be the Incident Commander when on the scene.

F. FACILITY/DEPARTMENT CHEMICAL SPILL CLEAN-UP KITS

Each facility or department that uses, handles, or stores hazardous chemicals will make a periodic (at least on a year) determination, with the assistance of SRS if needed, on the quantity and contents of properly stocked chemical spill clean-up kits. **It is the fiscal responsibility of each facility or department to procure stock and maintain chemical spill kits.** All potentially affected laboratory personnel must be properly trained in the proper use of these chemical spill clean-up kits.

Each area that uses or stores hazardous chemicals must have a properly stocked chemical spill clean-up kit readily available to each work area. The chemical spill clean-up kit must be in a single, easily transported container (such as a five-gallon plastic bucket), be centrally located, be easy to get to, and must be labeled as a CHEMICAL SPILL CLEAN-UP KIT. Contents must be tailored to or be appropriate for the types of hazardous chemical use(s) in the area. Minimum contents may include: chemical resistant gloves (neoprene, nitrile, etc.); shoe cover; coveralls, safety goggles or face shield; absorbent materials (spill pillows, vermiculite, litter box filler, etc. and scoop); hand-held brush and dust pan; neutralization agents; plastic bags; etc. Examples of spill kits may include, but not be limited to:

General Purpose Spill Kit for Solvents and Organic Liquids

- General purpose or universal absorbent pads (depending upon vendor);
- Disposable vinyl apron, disposable sleeves, respirator, safety goggles, and Nitrile gloves.

Base Spill Clean-up Kit for Strong Bases such as Sodium Hydroxide, Ammonium Hydroxide, etc.

- Dry base neutralizer (1 lb);
- Absorbent socks – to isolate, absorb and prevent spreading;
- Safety goggles, Neoprene gloves, disposable suits or vinyl apron, and disposal bags.

Acid Spill Clean-up Kit for Strong Acids such as Hydrochloric, Sulfuric Acid, Nitric Acid, etc.

- Dry acid neutralizer (1 lb) powder to absorb and neutralize acids;
- Absorbent socks – to isolate, absorb and prevent spreading;
- pH paper, gloves, vinyl apron or Tyvek suit, safety goggles, and disposal bags.

Hydrofluoric Acid Spill Kit "you must seek immediate medical attention after any contact"

- SpillFyter dry HF neutralizer (1 lb), or equivalent from a different vendor,
- Calcium Gluconate Gel 30 gm tube -- used as a first aid ointment on HF burns;
- Absorbent pads, Neoprene gloves, pH paper, vinyl apron or Tyvek suit, safety goggles, and disposal bags.

G. ADMINISTRATION

This program will be reviewed and updated as needed by SRS. Documentation of all actions taken during the event will be the responsibility of SRS's Environmental Health/Chemical Hygiene Managers. An evaluation and debriefing of each incident will be completed within two weeks of each incident.

H. DISPOSAL OF SPILL RESPONSE WASTE MATERIALS

The disposal of spill clean-up materials is the sole responsibility of the SRS staff. The only exception is if properly trained personnel have determined that it is acceptable to dispose of these materials into a sanitary sewer or trash receptacle, after they reference the University's Hazardous Chemical Waste Program and/or Wastewater Program.

J. AUTHORITY

SRS's University Safety Officer (or alternatively, in this person's absence, either the Chemical Hygiene Manager or Environmental Health Manager) is responsible for coordination with internal and external agencies responding to a HazMat event. Specific responsibilities include:

- Development, implementation and maintenance of the Chemical Spill Response Program.
- On-site coordination of major life threatening chemical spills, as appropriate.
- Reporting the chemical spill to regulatory authorities, as appropriate.
- Coordinating the cleanup of the major spills by responsible laboratory personnel, as appropriate.
- Coordinating emergency response activities with the New Mexico State Police, as appropriate.

It is understood that the New Mexico State Police, as directed in the New Mexico State Emergency Management Act, has overall authority over all HazMat events and will be the Incident Commander when on the scene.

Attachment A

CHEMICAL SPILL RESPONSE FLOW CHART

DETERMINE THE TYPE OF SPILL AND HOW TO RESPOND

⇓

- Chemical has low acute toxicity.
- Employee has used the chemical in the lab.
- Employee has been trained by the CSO.
- Personal protective equipment is available, if needed.
- Spill clean-up supplies are available.
- Employee has not been injured and is not experiencing any adverse symptoms of chemical exposure.

⇓

Minor

⇓

- The individual who caused the spill is responsible for proper clean-up.
- Clean up the spill using an appropriate procedure, such as one of the SRS Spill Response Guides in Attachment C, or the spill clean-up procedures in the MSDS.
- Dispose of spill clean-up materials through SRS, which has sole responsibility for proper chemical waste disposal at UNM.

⇓

- Chemical is highly toxic, highly reactive or explosive.
- Spill is out of control and may significantly and adversely affect other areas of the building or the environment.
- Spill has caused or may cause injury/death.
- Spill may become a fire emergency.
- Spill cannot be safely contained or cleaned up by responsible laboratory personnel
- Employee has not been trained by the CSO.

⇓

Major

⇓

Follow the E.A.R steps:

E → Evacuate immediately affected area and close doors.

A → Alert Campus Police by calling 911 from a safe location.

R → Remain close to the phone, if requested to do so, until contacted by appropriate emergency responders. Be prepared to relate appropriate details regarding the spill, including MSDS copies, if safe to do so.

⇓

COMPLETE CHEMICAL SPILL REPORT FORM LOCATED IN ATTACHMENT B

ANY CHEMICAL SPILL THAT OCCURS OUTSIDE A BUILDING THAT HAS THE POTENTIAL FOR ADVERSELY IMPACTING STORM WATER QUALITY MUST BE REPORTED TO SRS (VERN HERSHBERGER) AT 277-9756 OR 269-8343.

CHEMICAL SPILL REPORT FORM

Please forward to the Safety and Risk Services Department
FAX 277-9006 or mail to MSC07 4100

To be completed by the Chemical Safety Officer (CSO), Building Coordinator or designee immediately following all chemical spill response activities.

DATE OF SPILL: _____ **TIME:** _____ **DEPARTMENT:** _____

BUILDING: _____ **ROOM #:** _____

SPILL LOCATION (be specific): _____

_____

MATERIAL SPILLED: _____ **AMOUNT SPILLED:** _____

CSO/CONTACT PERSON: _____ **TELEPHONE #:** _____

SPILL RESPONSE ACTIONS TAKEN: _____

_____

_____

_____

RECOMMENDATIONS REGARDING SPILL CLEANUP EFFORTS: _____

_____

_____

_____

To be completed by the Department of Safety and Risk Services.

ANALYSIS OF SPILL RESPONSE: _____

_____

_____

_____ **SUCCESSFUL SPILL RESPONSE** _____ **UNSUCCESSFUL SPILL RESPONSE**

ACTIONS TO BE IMPLEMENTED TO IMPROVE FUTURE SPILL RESPONSE ACTIVITIES: _____

_____

_____

_____

_____

The University of New Mexico

Risk Management And Safety, Health and Environmental Affairs

STORM WATER POLLUTION PREVENTION AT UNM

SHEA would like your help in keeping the storm water that flows off the campus as clean as possible. This article will summarize what the issues are and how you can help UNM to be a good neighbor for the environment.

Similar to most metropolitan areas, nearly all storm water in the Albuquerque area flows to the Rio Grande River without any treatment. Therefore, the best approach is to keep materials that may harm the river from being flushed away by storm water. The following list of materials will negatively impact the river if flushed away with storm water:

*Hazardous Chemicals, including automotive fluids, e.g., gasoline, oil, coolant, transmission and brake fluids, etc.;
*Litter, e.g., paper and plastic trash and to a lesser extent leaves and plant materials;
*Loose/Disturbed Soil, e.g., from construction sites;
*Animal Wastes, especially dog droppings; and,
*Construction and artwork materials, especially paint, paint rinse water, paint thinners and powders, e.g., lime.

How You Can Help

We live in an arid climate and therefore, do not often have to plan for rain or consider what will happen if it rains. Therefore, we need to develop an active consciousness that considers, "*What will happen if it rains?*" The following measures will help UNM to remain a good environmental steward in this regard:

1. Have your vehicle properly repaired and maintained to prevent fluid leaks while parked at UNM. Better yet, ride a bike, car-pool, take the bus, etc. Performing oil changes or other significant automotive repair or maintenance work on campus outside of the proper facilities, e.g., the PPD Automotive Center, is forbidden by UNM policy;
2. Pick up litter and put it in a trash receptacle;
3. Bring bags/containers to pick up and properly dispose of your dog's droppings as you walk or jog on campus;
4. Wash water-based paint out of brushes, etc., in a sink that drains to the sanitary sewer;
5. Oil-based paints and thinners, as with nearly all hazardous materials and wastes cannot be dumped any-where (e.g., down the drain, on the ground or in the trash). They must be containerized, labeled and disposed of through SHEA for all UNM operations. Contact SHEA for advice on disposal options for non-UNM generated wastes as well; and
6. If you see a significant automotive fluid leak, someone changing/dumping their oil on campus, or any activities on campus including construction work that threaten storm water, please promptly contact SHEA at 277-2753. Please do not report oil stains/drips on pavement since asphalt fortunately absorbs lubricating oils and storm water will not readily flush it away.

To carry this a step further, if you see a friend or neighbor doing something that could pollute UNM storm water, e.g., littering or not picking up their dog's droppings while on campus, please politely educate them. Additionally, if you or a campus environmental advocacy group would like to further help SHEA's storm water pollution prevention efforts, please contact Vern Hershberger at 277-2753.

SPILL PREVENTION AND RESPONSE PROGRAM

for

STORMWATER POLLUTION PREVENTION AT UNM

Preface

The University of New Mexico (UNM) endeavors to be a good neighbor to our community and the natural environment. To that end, UNM strives for proactive and cost-effective solutions to minimize impacts to our campus community and neighbors.

Consistent with those goals, UNM continues to educate and train internal staff on storm water pollution prevention (SWP2) techniques and requirements. UNM employs outside contractors and design professionals who are already proficient with incorporating SWP2 into their work for UNM.

The following attempts to document UNM's ongoing and evolving SWP2 efforts regarding preventing and responding to spills. As desired by all involved, including the EPA, this program is not cast-in-stone, and will be periodically modified in order to allow future improvements.

I. Spill Prevention Measures

UNM's Department of Risk Management/Safety, Health & Environmental Affairs (RRSHEA) oversees the environmental, health and safety (EH&S) issues at UNM. To remain proactive in preventing spills, RSHEA personnel periodically inspect existing campus facilities and constructions sites. Furthermore, RSHEA staff review and comment on the plans and specifications for new and remodeled facilities.

In regards to minimizing storm water pollution from spills, RSHEA continues to request the following measures to proactively prevent spills:

1. New aboveground containers/tanks larger than 55 gallons that contain regulated liquids are either protected from vehicle collision by barriers, e.g., bollards, fencing or buildings, and/or are constructed with secondary containment.
2. Loading/unloading operations for large volumes (>25 gallons) of regulated liquids and solids are either done within covered/roofed areas, e.g., with water treatment chemicals, and/or are done are under the direct observation of experienced technicians on installations equipped with spill and overfill protection equipment, e.g., fueling USTs.

II. Spill Response Procedures

If RSHEA is notified about or self discovers any indication of a spill that may have significant negative impact to storm water quality, then mitigation and response work will begin within 2 hours. A process for contacting RSHEA staff on a 24-hour per day basis continues to be available via the UNM Police Department.

The RSHEA Chemical Spill Response Program provides specific procedures on mitigating and responding to spills. As stated above, mitigation and response work will begin within two (2) hours of confirmation with all exterior spills being remediated as soon as possible, especially if precipitation is occurring or appears imminent. The duration of all remediation efforts will be a direct function of the magnitude and nature of the specific spill requiring mitigation.

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Spill Mitigation

1. If the spilled material can be safely neutralized, such as, adding a weak base to neutralize an acid spill, then this will be done.
2. Stormwater inlets will be diked with soil or absorbents/pigs to minimize regulated liquid discharge into the MS4.
3. Spilled regulated liquids, such as, petroleum-based automotive fluids, will be either removed from hard surfaces (concrete) with absorbents, etc., or from porous surfaces by either soil excavation for large quantities, or by enhanced bioremediation (applying on MicroBlaze, etc.) on soil or other porous surfaces, such as, asphalt.
4. Spilled solids, e.g., Portland Cement, will be swept up off of hard surfaces or scraped off of soft surfaces, such as, soil.
5. All recovered spilled materials and adsorbents will either be beneficially reused, recycled or be properly disposed.

Spill Response

1. If the spill is small and not particularly hazardous, the spiller is required to self-respond, and/or to call RSHEA for assistance.
2. If the spill is large and/or potentially hazardous, the spiller is required to immediately contact RSHEA. Then RSHEA, depending on the spill size and degree of hazard will either respond to the spill with internal staff, and/or contact the Albuquerque Fire Dept., and/or contact an on-call spill response contractor, e.g. Rinchem Chemical, Inc. to perform the clean up.
3. As described in the Illicit Discharge Inspection/Elimination Certification, RSHEA, the Albuquerque Fire Department, or the spill response contractor will make the required initial verbal notifications to the EPA, NMED, etc. RSHEA will produce and send any required written follow-up reporting.

III. PROGRAM IMPLEMENTATION CERTIFICATION

I am an authorized representative, as described in Appendix G, Subsection 11 of the NPDES General Permit.

I certify that the University of New Mexico (UNM) will continue to implement the Spill Prevention and Response Program as described above. To continue to improve the efficiency and effectiveness of this relatively new program, UNM anticipates changes to it periodically in the future. All such changes will be compliant with NPDES regulations and consistent with storm water pollution prevention goals.

I certify under penalty of law that this program and attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

David W. Harris
Executive Vice President for Administration

5/7/05
Date

Section 4.02 Attachment C

Back to Section 4.02

Chemical Spill

Spill Response Guide For: Acids

Spill Response Guide For: Bases (Caustics, Alkaline Materials)

Spill Response Guide For: Flammable Liquids

Spill Response Guide For: Formaldehyde/Formalin

Spill Response Guide For: Mercury

Spill Response Guide For: Oxidizers

SPILL RESPONSE GUIDE FOR: ACIDS

NOTE: Personnel can clean up the vast majority of acid spills. Whoever caused the spill is responsible for proper notification and clean-up, if safe to do so.

PHYSICAL/HEALTH HAZARDS:

- Corrosive material, contact causes burns to skin and eyes.
- Harmful if inhaled: many acids give off toxic fumes.
- Some acids are also flammable or oxidizers and can start a fire if in contact with organic matter. Fire may produce irritating or poisonous gas.

PERSONAL PROTECTIVE EQUIPMENT:

- Acid-resistant gloves
- Goggles or face shield
- Chemical resistant apron
- Other universal equipment such as but not limited to, respirator with acid gas cartridges, booties, rubber boots, disposable Tyvek suit, etc.

SPILL RESPONSE GUIDELINES:

1. **Contain spill**. Examine Material Safety Data Sheet for guidelines for spill containment. Light weight absorbent material, such as pads or socks, should be used to contain spills. Remove all sources of ignition and ensure adequate ventilation for clean -up. Unless acid is dilute, less than 4%, do not flush with water since many concentrated acids react violently in the presence of water. **Note: Perchloric Acid and Nitric Acid react violently and explosively with organic chemicals and organic material such as wood, cotton and paper; therefore, do not use organic absorbent material on these particular acids.**

2. **Neutralize spill**. Carefully use MSDS-recommended or commercially available neutralizers such as Bicarbonates or Carbonates to neutralize spills. Use pH indicator paper to determine if spill is neutralized (pH 7). **Use Caution: Neutralization reactions generate heat.**

3. **Clean up neutralized material**. Use non-metal, non-sparking tools to sweep up neutralized spill debris. Do not allow material to enter any sewer or to contaminate soil. Place spill cleanup materials in acid -resistant bags, seal, and place in garbage, as long as the waste does not contain other EPA -regulated materials.

EMERGENCY PROCEDURES

1. **Major spills**. Evacuate the area immediately and call 911.
2. **Contact with eyes or skin**. Immediately flush affected area with water for at least 15 minutes. Seek medical attention.

SPILL RESPONSE GUIDE FOR: BASES (CAUSTICS)

NOTE: Personnel can clean up the vast majority of spills of caustics. Whoever caused the spill is responsible for proper notification and clean-up, if safe to do so.

PHYSICAL/HEALTH HAZARDS:

- Corrosive material, contact causes burns to skin and eyes. Most bases do not wash off the skin and eyes with cold water, warm water must be used to wash the effected area often for hours.
- Harmful if inhaled. May be in solid form and cause airborne dust
- Fire may produce irritating or poisonous gas.

PERSONAL PROTECTIVE EQUIPMENT:

- Chemical-resistant gloves
- Goggles or face shield
- Chemical-resistant apron
- Other universal equipment such as but not limited to, particulate respirator, booties, rubber boots, disposable Tyvek suit, etc

SPILL RESPONSE GUIDELINES:

1. **Contain spill** Consult Material Safety Data Sheet for guidelines for spill containment. Light weight absorbent materials, such as pads or socks, should be used to contain spills **Ensure adequate ventilation for clean -up. Do not use water to flush bases in powdered form, such as calcium oxide (lime), as this material is not very soluble.**

2. **Neutralize spill.** Carefully use MSDS-recommended or commercially available neutralizers such as citric acid or sodium bisulfate to neutralize spills Liquid or solid sodium and potassium hydroxides may be neutralized with weak solutions of acetic acid Ammonium hydroxide can be neutralized with dilute hydrochloric or sulfuric acid solutions Use pH indicator paper to determine if spill is neutralized (pH 7). **Caution: Neutralization reactions give off heat .**

3. **Clean up neutralized material** Use non-metal non-sparking tools to sweep up neutralized spill Do not allow material to enter any sewer or to contaminate soil Place spill cleanup materials in plastic bags and dispose in the garbage, provided that the material does not contain any other EPA-regulated materials.

EMERGENCY PROCEDURES

1. **Major spills** Evacuate the area immediately and call 911.
2. **Contact with eyes or skin.** Immediately flush affected area with water for at least 15 minutes. Due to the poor solubility of some bases in water, it may be necessary to wash the affected area with water for an extended period of time Seek medical attention.

SPILL RESPONSE GUIDE FOR: FLAMMABLE LIQUIDS

NOTE: Laboratory personnel can clean up the vast majority of spills. Whoever caused the spill is responsible for proper notification and clean-up, if safe to do so.

PHYSICAL/HEALTH HAZARDS

- Extreme fire and explosion hazard.
- Most flammable liquids vaporize readily leading to high concentrations in air.
- Harmful if inhaled. May affect central nervous system.
- Harmful by skin absorption.

PERSONAL PROTECTIVE EQUIPMENT

- Chemical-resistant gloves
- Goggles or face shield
- Chemical-resistant apron
- Other universal equipment, such as but not limited to, respirator with organic vapor cartridges, booties, rubber boots, disposable Tyvek suit, etc.

SPILL RESPONSE GUIDELINES

1. **Contain spill.** Consult Material Safety Data Sheet for guidelines for spill containment. Use light weight absorbent materials, such as pads or socks, to reduce vapors and contain spills. **Remove all sources of ignition. Ensure adequate explosion-proof ventilation for clean-up.**

2. **Clean up spill material.** Use absorbent material to clean up spilled material. Use non-metal, non-sparking tools for cleanup procedures. Do not allow material to enter any sewer or to contaminate soil. Place spill cleanup materials in materials in plastic bags and dispose in the garbage, provided that the material does not contain any other EPA -regulated materials.

EMERGENCY PROCEDURES

1. **Major spills.** Evacuate the area immediately and call 911.
2. **Contact with eyes or skin.** Immediately flush affected area with water for at least 15 minutes. Seek medical attention.

SPILL RESPONSE GUIDE FOR: FORMALDEHYDE/FORMALIN

NOTE: Personnel can clean up the vast majority of spills. Whoever caused the spill is responsible for proper notification and clean-up, if safe to do so.

PHYSICAL/HEALTH HAZARDS

- Carcinogen
- Irritant
- Can cause dermatitis and pulmonary edema

PERSONAL PROTECTIVE EQUIPMENT

- Chemical-resistant gloves
- Goggles or face shield
- Chemical-resistant apron
- Other universal equipment, such as but not limited to: respirator with organic vapor/formaldehyde cartridges, booties, rubber boots, disposable Tyvek suit, etc.

SPILL RESPONSE GUIDELINES

1. **Contain spill**. Consult Material Safety Data Sheet for guidelines for spill containment. Use light weight absorbent material, such as pads or socks or commercially available formaldehyde spill neutralizer, to reduce vapors and contain spills. **Remove all sources of ignition. Ensure adequate explosion-proof ventilation for clean-up**. Leaking containers should be placed in a well-ventilated area or chemical fume hood.

2. **Clean up spill material**. Use absorbent material to clean up spilled material. Use non-metal, non-sparking tools for cleanup procedures. Do not allow material to enter any sewer or to contaminate soil. Place spill cleanup materials in chemical-resistant containers for pickup by RSHEA staff for proper disposal.

EMERGENCY PROCEDURES

1. **Major spills**. Evacuate the area immediately and call 911.
2. **Contact with eyes or skin**. Immediately flush affected area with water for at least 15 minutes. Seek medical attention.

SPILL RESPONSE GUIDE FOR: MERCURY

NOTE: Personnel can clean up the vast majority of spills. Whoever caused the spill is responsible for proper notification and clean-up, if safe to do so.

PHYSICAL/HEALTH HAZARDS:

- Harmful if inhaled. Mercury is readily absorbed into the body and may lead to central nervous system disorders.
- Short-term exposure can lead to headaches, emotional disturbances, chest pain/tightness, and soreness of the mouth, loss of teeth, nausea, fatigue and unsteadiness.
- Readily vaporizes. **A four square inch surface of mercury exposed to air in a small laboratory can raise the mercury vapor level to 0.2 mg/m3 within five minutes, the OSHA Permissible Exposure Limit (ceiling) is 0.1 mg/m3.**

PERSONAL PROTECTIVE EQUIPMENT

- Chemical-resistant gloves
- Goggles or face shield
- Other universal equipment, such as but not limited to, respirator with acid gas cartridges, booties, rubber boots, disposable Tyvek suit.

SPILL RESPONSE GUIDELINES

1. **Secure spill area**. Consult Material Safety Data Sheet for guidelines for spill containment. Determine the size of the spill area. Mercury beads may have fallen outside of the immediate spill area. A flashlight can be used to inspect for mercury in outlying areas. Restrict employees from the spill area to ensure mercury contamination will not spread beyond the immediate spill area.

2. **Contain spill**. Use rigid paper to consolidate droplets into a larger pool. Pick up pool of mercury, or other droplets, with a hand-held vacuum. Do not use a brush. If you are unsure that you have collected all the mercury, contact RSHEA for use of their special mercury vacuum. **Ensure adequate ventilation for clean-up.**

3. **Clean up spill material**. Use non-metal, non-sparking tools for cleanup procedures. Do not allow material to enter any sewer or to contaminate soil. Place spill cleanup materials in chemical-resistant containers for pickup by RSHEA staff.

EMERGENCY PROCEDURES

1. **Major spills**. Evacuate the area immediately and call 911.
2. **Contact with eyes or skin**. Immediately flush affected area with water for at least 15 minutes. Seek medical attention.

SPILL RESPONSE GUIDE FOR: OXIDIZERS

NOTE: Personnel can clean up the vast majority of spills. Whoever caused the spill is responsible for proper notification and clean-up, if safe to do so.

PHYSICAL/HEALTH HAZARDS

- Promotes combustion
- May be harmful if inhaled or absorbed through the skin

PERSONAL PROTECTIVE EQUIPMENT:

- Chemical-resistant gloves
- Goggles or face shield
- Other universal equipment, such as but not limited to, respirator with acid gas cartridges, booties, rubber boots, disposable Tyvek suit, chemical resistant apron, etc.

SPILL RESPONSE GUIDELINES

1. **Contain spill.** Consult Material Safety Data Sheet for guidelines for spill containment. Use non-combustible absorbent material to reduce vapors and contain spills. **Remove all sources of ignition. Ensure adequate explosion-proof ventilation for clean-up**

2. **Clean up spill material.** Use non-combustible absorbent material to wipe up spilled material. Use non-metal, non-sparking tools for cleanup procedures. Do not allow material to enter any sewer or to contaminate soil. Place spill cleanup materials in materials in plastic bags and dispose in the garbage, provided that the material does not contain any other EPA -regulated materials

EMERGENCY PROCEDURES

1. **Major spills.** Evacuate the area immediately and call 911.
2. **Contact with eyes or skin.** Immediately flush affected area with water for at least 15 minutes. Seek medical attention.

4.03 CHEMICAL STORAGE PROGRAM

This program contains requirements for practices designed and implemented to protect University employees, students, visitors and the environment from the risks of hazardous chemicals that are used and stored on University property.

A. SCOPE

This program is applicable to all University students, faculty and staff that are required by the nature of their job to use and store hazardous chemicals.

B. DEFINITIONS

Material Safety Data Sheet (MSDS) - Written or printed material prepared by the manufacturer of a hazardous chemical that contains information about the hazards of the chemical and the appropriate work practices required for use.

NFPA-approved - Approved by the National Fire Protection Association

Pyrophoric chemicals - Any liquid or solid chemicals that will ignite spontaneously in air below 130°F (54.4°C)

U.S. Department of Transportation hazard classes and divisions – see 49 CFR Part 173.

2.1 Flammable gas –

- Is a gas at 68° and burns readily in air
- Is ignitable at 101.3 KPa (14.7 psia) when in a mixture of 13 percent or less by volume with air.
- Has a flammable range at 101.3 KPa (14.7 psia) with air of at least 12 percent regardless of the lower limit

2.2 Non-flammable compressed gas - Gas shipped at a pressure >= 41 psi absolute, which is neither flammable nor poisonous. $PSI_{absolute} = PSI_{gauge} + PSI_{atmospheric}$

2.3 Poisonous gas - Is a gas at 68°F and has an LC_{50} <5,000 ml/m^3 (i.e., one half of one percent concentration in air will kill half of the animals in a laboratory test)

3 Flammable liquid - Liquid with a flash point <=141°F Note: Flash point is the temperature at which a liquid gives off enough vapor to ignite and "flash" back to the liquid surface.

3 Combustible liquid - Liquid with a flash point above 141°F but below 200°F.

4.1 Flammable solid - Strongly exothermic decomposition at normal temperatures <u>or</u> ignites through friction (e.g., matches) <u>or</u> burns very fast or persistently when ignited

4.2 Spontaneously combustible material - Spontaneously ignites within 5 minutes on exposure to air or can undergo strongly exothermic decomposition even in the absence of oxygen

4.3 Dangerous when wet material - Spontaneously ignites or emits flammable or toxic gasses when contacted with water

5.1 Oxidizer - Any solid, liquid or gaseous chemical that causes or enhances combustion of other materials or readily react to oxidize combustible materials, generally by yielding oxygen (e.g., sodium nitrite, oxygen gas, hydrogen peroxide, etc.)

5.2 Organic peroxide - A specific chemical group that is generally reactive, which contains oxygen in the bivalent –O-O- structure and which may be considered a derivative of hydrogen peroxide

6.1 Poisonous materials - Solids or liquids that are poisonous as defined by:

- Oral Toxicity A material with an acute LD_{50} of not more than 300 mg/kg
- Dermal Toxicity A material with an acute LD_{50} of not more than 1000 mg/kg
- Inhalation Toxicity A dust, or mist with an acute LC_{50} of not more than 4 mg/L.

8 Corrosive material - Any solid, liquid or gaseous chemicals that dissolve steel or aluminum, or that burn, irritate, destructively attack organic tissues, and destroy skin tissue

C. GENERAL STORAGE REQUIREMENTS FOR ALL CHEMICALS

1. Label all chemical containers appropriately. If transferring chemicals out of their original container to another container or if the original container label is illegible, follow the chemical labeling guidelines as detailed in UNM's Hazard Communication Program.

2. Be knowledgeable of the procedures contained in SRS's Chemical Spill Response Program to prepare yourself and others in the event that any chemical container leaks or is spilled.

3. Follow all precautions regarding the storage of incompatible chemicals. Consult the label and Material Safety Data Sheet (MSDS) for each chemical to ensure that you are familiar with the chemical and how it should be handled, stored and disposed. **Separate all chemicals into compatible groups.**

4. Provide a definite storage place for each chemical and return the chemical to that same location after each use.

5. Avoid storing chemicals in laboratory fume hoods or on bench tops, except for those chemicals intended to be used by the end of the day.

6. Store volatile toxic chemicals and odorous chemicals in a ventilated cabinet, if possible. The cabinet's associated electrical components must be explosion-proof if flammable materials are being ventilated. If located in a laboratory, locate the cabinet near the fume hood. Store other chemicals inside a closable cabinet or on a shelf that has a lip to prevent containers from sliding off in the event of a fire or other serious accident.

7. Do not expose stored chemicals to heat, direct sunlight or freezing conditions.

8. Store all containers of liquids on compatible plastic trays that are capable of holding the contents of the container if it leaks. Store liquids on lower shelves, if at all possible.

9. Close all chemical containers well to minimize the escape of flammable, corrosive, irritating or toxic vapors or gases.

10. Ventilation is required for chemicals that may release dangerous or damaging quantities of vapors or gases which may be flammable, corrosive, irritating or toxic (see item 6 above).

11. For every chemical storage area, there should be evacuation and emergency procedures to be followed and fire extinguishers available in the case of personal exposure or a leak, spill or fire within the room. Ventilation rates should exceed at least six air changes per hour.

D. STORAGE REQUIREMENTS FOR FLAMMABLE AND COMBUSTIBLE CHEMICALS

1. The storage area should be separated and protected so that a fire or spill in the storage area is not likely to spread beyond the storage area.

2. If containers of flammable and combustible liquids are larger than five (5) gallons in size, special provisions are necessary to prevent liquid from flowing out of the storage area in the event of a spill or leak. Contact SRS at 277-2753 for further details.

3. When possible, store quantities of flammable liquids greater than four (4) liters in NFPA-approved safety cans. Store all flammable liquids and solids in NFPA-approved storage cabinets.

4. Do not store flammable chemicals in any refrigerator unless it has been designed for that purpose. Ordinary refrigerators contain spark sources that can ignite flammable vapors. If refrigerated storage is needed inside of a flammable storage room, an explosion-proof refrigerator must be used. Use chemical storage refrigerators only for storing chemicals, never food or drink. Label these refrigerators with the following signage:

   NO FOOD OR DRINK TO BE STORED IN THIS REFRIGERATOR

5. Safety Equipment for Storage of Flammable Liquids

Safety Cans: Safety cans are containers that have built-in safety features for protecting flammable liquids from exposure to a fire situation. In a fire situation, a safety can is exposed to extremely high temperatures. This heat is transmitted to the contents, which in turn boil and

produce a large vapor pressure. Every safety can is fitted with a spring-loaded cap that vents these vapors safely without bursting the can. The other safety feature of a safety can is the flame arrestor that consists of a cylindrical wire screen. Vapors emitted from a safety can will ignite when exposed to the flames of a fire. Since flames usually flash back to the source of liquid, the flame arrestor serves as a heat dissipator. The temperature in the space above the liquid in a safety can is lowered below the ignition temperature and ignition of the contents is eliminated.

Flammable Liquid Storage Cabinets: Flammable liquid storage cabinets are designed to maintain the temperature at the top of the cabinet interior below 325°F when subjected to a 10-minute fire test. Cabinets built to withstand the temperature rating during the 10-minute fire test are acceptable by OSHA standards if: (a) the maximum capacity of Flammable liquids is not more than 60 gallons; and (b) the cabinet is labeled with conspicuous lettering, such as FLAMMABLE-KEEP FIRE AWAY. All storage cabinets should have self-closing doors that will close the latch automatically when released. These doors must not be blocked open.

Special Refrigerators: Special refrigerators that can safely store flammable liquids have a spark-free interior such that all wiring and thermostat controls have been removed from the interior. Two types of these refrigerators are commercially available: a "flammable liquid storage" model and an "explosion-proof" model. A "flammable liquid storage" model is normally used in a non-explosive area where no flammable vapors are present. Such a refrigerator is normally powered through a standard three-wire cord plugged into an electrical outlet. An "explosion-proof" refrigerator is required when the area in which the refrigerator will be located has the potential for ignition of flammable vapors. An explosion-proof refrigerator is supplied with a "pigtail" cord that must be wired directly to a power source using metal conduit as specified by local electrical codes. Choosing the appropriate refrigerator will depend on the area in which it will be located.

E. STORAGE REQUIREMENTS FOR REACTIVE CHEMICALS

1. Consider the storage requirements of each reactive chemical prior to purchasing.

2. Consult the label and MSDS in making decisions about storage of reactive chemicals.

3. Use and store only the quantities of material you will need for immediate use.

4. Cyanides and sulfides should be stored in a location separate from acids or protected from contact with acids.

5. All acids should be stored separately from all alkaline materials (bases).

6. Date all highly reactive materials as soon as received and make sure the label states:

DANGER! HIGHLY REACTIVE MATERIAL

7. Do not open a container of highly reactive material that is past its expiration date. Call SRS at 277-2753 for assistance.

8. Dispose of highly reactive material through SRS prior to the expiration date.

9. Segregate the following materials:

- oxidizing agents (**5.1**) from reducing agents, flammables (**3**) and combustibles (**3**)
- powerful reducing agents from readily reducible substrates
- pyrophoric compounds from flammables (**3**)
- perchloric acid from reducing agents and combustibles (**3**)

10. Store reactive liquids in trays constructed of compatible materials which are large enough to contain the contents of the bottles. Store perchloric acid bottles in glass or ceramic trays.

11. Store materials that react vigorously with water away from any possible contact with water. If chemicals are to be stored that are reactive if exposed to the air or water, they can safely be stored in sprinklered areas where sprinkler discharge would serve to prevent rupture of the outer container.

12. Temperature control or refrigeration must be provided, as needed, for chemicals that deteriorate or react if their temperatures exceed safe limits recommended by the manufacturer or person synthesizing the chemical. Store thermally unstable materials in a refrigerator with the following safety features: all spark-producing controls are on the outside, a magnetic locked door, an alarm to warn when the temperature is too high.

13. Assign responsibility for the storage areas utilized for highly reactive materials to one (1) primary person and a backup person. Review this responsibility at least twice yearly.

14. Some highly reactive shock/heat sensitive materials are:

Ammonium perchlorate	Dibenzoyl peroxide
Ammonium permanganate	Diisopropyl peroxydicarbonate
Anhydrous perchloric acid	Dinitrobenzene (ortho)
Butyl hydroperoxide	Ethyl methyl ketone peroxide
Butyl perbenzoate	Ethyl nitrate
t-Butyl peroxyacetate	Hydroxylamine
t-Butyl peroxypivalate	Peroxyacetic acid
1-Chloro-2,4-dinitrobenzene	Picric acid (<10% water content)
Cumene hydroperoxide	Trinitrobenzene
Diacetyl peroxide	Trinitrotoluene

F. STORAGE REQUIREMENTS FOR OXIDIZERS

Oxidizing agents such as chlorates, perchlorates, peroxides, nitric acid, nitrates, nitrites and permanganates represent a significant hazard because of their propensity under certain conditions to undergo vigorous reactions when they come into contact with easily oxidized material such as metal powders and organic materials like wood, paper and other combustible material. Mineral acids such as perchloric acid, sulfuric acid and nitric acid, as well as other oxidizers, should be stored separate from flammables and combustibles, by separate rooms, cabinets or break resistant containers. If large bottles must be stored in proximity of flammable materials, acid resistant trays must be used to prevent the oxidation of wood or corrosion of metal shelves.

1. Class I Oxidizer

Class I oxidizers will cause an increase of the burning rate of combustible material with which it comes in contact. Some examples are:

Hydrogen peroxide (8-28%)	Magnesium perchlorate
Nitric acid (70% or less)	Silver nitrate
Perchloric acid solutions (less than 60% wt/wt)	

2. Class II Oxidizer

Class II oxidizers will cause an increase of the burning rate or may cause spontaneous ignition of combustible material with which it comes in contact. Some examples are:

Calcium hypochlorite (50% or less wt/wt)	Chromic acid
Hydrogen peroxide (28-52% wt/wt)	Sodium peroxide
Liquid oxygen	

Contact SRS if quantities are stored in excess of 1,000 lbs.

3. Class III Oxidizers

Class III oxidizers will cause a severe increase in the burning rate of combustible material with which they come in contact, or will undergo vigorous self-sustained decomposition when catalyzed or exposed to heat. Regulated quantities are permitted to be stored only on the ground floor of a building with no basement. Some examples are:

Ammonium dichromate	Perchloric acid solutions (60-73%)
Hydrogen peroxide (52-91% wt/wt)	Sodium chlorate

Contact SRS if quantities are stored in excess of 200 lbs.

4. Class IV Oxidizer

Class IV oxidizers can undergo an explosive reaction when catalyzed or exposed to heat, shock, or friction. Regulated quantities are permitted to be stored only in detached storage. Storage areas for Class IV oxidizers must be provided with a means to vent fumes in any type of emergency. Some examples are:

Ammonium perchlorate	Perchloric acid solutions
Ammonium permanganate	(greater than 72.5%)
Hydrogen peroxide (greater than 91% wt/wt)	Potassium superoxide

Contact SRS if quantities are stored in excess of 10 lbs.

G. STORAGE REQUIREMENTS FOR TOXIC CHEMICALS

1. Store chemicals known to be highly toxic, including carcinogens, in ventilated storage in unbreakable, chemically resistant secondary containers.

2. Keep quantities on hand at an absolute minimum.

3. Limit access to these areas, and label storage areas with appropriate warning signs, e.g.:

CAUTION! REPRODUCTIVE TOXIN STORAGE

-or-

CAUTION! CANCER-SUSPECT AGENT STORAGE

4. Storage areas for pesticides and other toxic chemicals should be secured when the storage areas are not supervised by a responsible person so that unauthorized personnel are kept out.

H. STORAGE REQUIREMENTS FOR PEROXIDIZABLE CHEMICALS

Some chemicals can spontaneously form unstable peroxides during storage or after prolonged exposure to air and light. Certain peroxides may detonate with extreme violence when they become concentrated by evaporation or distillation, when combined with other compounds to yield a detonable mixture, or when simply disturbed by unusual heat, shock or friction.

1. The following compounds, which form peroxides, must be properly labeled with compound identity, the date received, date opened, testing frequency for the chemical, and dates tested with peroxide strips:

Peroxidizable Chemical Classifications

List I (Three Months)*	List II (Six Months)*	List III (Twelve Months)*
Peroxide Hazard on Storage	**Peroxide Hazard On Concentration**	**Hazard Due to Peroxide Initiation of Polymerization**
Diethyl Ketene	Acetal	1,3-Butadiene
Divinyl Ether	Acetaldehyde	Chlorobutadiene
Isopropyl Ether	Cyclohexene	Chlorotrifluoroethylene
Potassium Metal	Cyclopentene	Styrene
Potassium Amide	Cumene	Tetrafluoroethylene
Sodium Amide	Diacetylene	Vinyl Acetate
Sodium Ethoxyacetylide	Dicyclopentadiene	Vinyl Acetylene
Vinylidene Chloride	Diethylene Glycol Dimethyl Ether	Vinyl Chloride
	p-Dioxane	Vinyl Pyridine
	Ethyl Ether	
If stored as a liquid:	Ethylene Glycol Dimethy Ether	
Butadiene	Furan	
Chloroprene	Methyl Acetylene	
Tetrafluoroethylene	Methylcyclopentane	
	Tetrahydrofuran	
	Tetrahydronaphthalene	
	Vinyl Ethers	

***Note:** Peroxide testing frequency after opening. Write on label (below) upon receipt.

Label:

Peroxidizable Compound _____
Warning: May Form Explosive Peroxides!
Date received _____ **Date opened** _____
Dispose of or test within _____ **months after opening!**
Test Date _____ **Peroxides** _____ **ppm**
Test Date _____ **Peroxides** _____ **ppm**
Test Date _____ **Peroxides** _____ **ppm**
Test Date _____ **Peroxides** _____ **ppm**
Test Date _____ **Peroxides** _____ **ppm**
Test Date _____ **Peroxides** _____ **ppm**
Test Date _____ **Peroxides** _____ **ppm**
Test Date _____ **Peroxides** _____ **ppm**
Contact SRS at 277-2753 for disposal or questions.

2. SRS disposal guidelines and administrative procedures:

SRS waste disposal personnel **will not pick up or take for disposal** any peroxidizable compounds **that have not been timely tested** for peroxides by researchers, in accordance with the following time periods and instructions:

List I: Must have been tested for peroxides within the previous three months;
List II: Must have been tested for peroxides within the previous six months;
List III: Must have been tested for peroxides within the previous twelve months;

Unopened containers must not exceed 18 months in storage, untested; and , all compounds must contain less than 10 ppm when offered to SRS as waste for disposal.

For those peroxidizable compound containers not meeting these timelines or criteria, SRS will tape a red warning label on the container, and arrange for a high hazard contractor to handle the compound and neutralize/stabilize/prepare it for disposal at the Principal Investigator's department's cost.

3. Storage and handling procedures:

Each person responsible for a laboratory must develop and maintain an inventory of the peroxidizable materials in the laboratory. The inventory should be reviewed every three (3) months, at which time containers/samples from List I (three (3) months or older), List II (six (6) months or older), and List III (twelve (12) months or older) would either be tested for peroxides or disposed of through SRS. Quantities of peroxidizable compounds should be purchased in smaller container sizes to minimize exposure to air from multiple openings of the container and minimize potential for formation of peroxides.

Store all peroxidizable compounds in tightly closed original container, and away from heat and light. Sunlight is an especially good promoter of peroxidation. Protection from physical damage and ignition sources during storage is also essential. Particular care should be given to ensure tight closure on storage containers. Loose or leaky closures may permit evaporation of storage material, leaving a hazardous concentration of peroxides in the container, and peroxide crystallization in the cap threads. Most common container materials, such as steel, stainless steel, copper, nickel, aluminum, baked phenolic linings and ceramics, are suitable for containers; however, they must be clean and free of metal oxides because iron or copper oxides may actually promote peroxide formation. The use of oxidation inhibitors is especially important in the safe handling of peroxidizable materials. Hydroquinone, alkyl phenols, aromatic amines or similar materials are recommended by the manufacturers as being effective in slowing peroxide formation during storage. Peroxidization in a chemical process may not only be a serious hazard because of the explosion potential, but may also affect lower yield and produce unwanted impurities.

These chemicals should be tested for peroxide formation before use. Commercially available peroxide test strips are simple to use, but require different test protocols depending upon the

nature of the sample and the manufacturer. Although views differ in the USA about unsafe/dangerous peroxide levels, it is recommended by SRS that researchers do not use the compound, if the peroxide test is above 100 ppm. For disposal, these compounds must be neutralized below 10 ppm peroxide.

4. Management and disposal of **old/outdated** containers:

Older containers of peroxidizable chemicals, or containers of unknown age, vintage or history, must be handled very carefully and should never be opened by researchers. Compounds that are suspected of having very high peroxide levels because of visual observation of unusual viscosity, visible discoloration, liquid stratification, crystal formation, or because of age should be considered extremely dangerous. The precautions taken for disposal of these materials should be the same as for any material that can be detonated by friction or shock. **IT IS OF THE UTMOST IMPORTANCE THAT THE CONTAINER NOT BE OPENED.** The act of opening the container **COULD DETONATE PEROXIDE CRYSTALS** under the container cap or other closure. Researchers must shall call SRS at 277-2753 for assistance with any potential peroxide **waste** issue. SRS will arrange to have the container(s) inspected, and if necessary, will arrange for a high hazard contractor to handle the container and neutralize/stabilize/prepare it for disposal.

I. CHEMICAL INCOMPATIBILITY CHART

Do not store these US DOT hazard classes together:

2.3	**with**	**2.1, 3, 4.1, 4.2, 4.3, 5.1, 5.2 or 8**
5.1	**with**	**2.3, 3, 6.1 or 8**
6.1	**with**	**2.1, 3, 4.1, 4.2, 4.3, 5.1, 5.2 or 8**
8	**with**	**4.1, 4.2, 4.2, 5.1 or 5.2**

J. CHEMICAL COMPATIBILITY CHART

RELATED AND COMPATIBLE STORAGE GROUPS

In general, chemicals should be separated and stored together according to the following compatible storage groups or categories:

- Inorganic (Solid/Liquid)
  Including but not limited to sulfates, chlorides, metals, etc.

- Inorganic (Acids)
  Including but not limited to nitric, sulfuric, hydrochloric, etc.,
  Note: Concentrations of 4N or greater requires compatible secondary containment.

- Inorganic (Bases)
  Including but not limited to ammonium hydroxide, sodium hydroxide, etc.,
  Note: Concentrations of 4N or greater requires compatible secondary containment.

- Organic (Solids)
  Including but not limited to citric, oxalate, etc.

- Organic (Liquids)
  Such as flammable solvents, acids, bases, etc.
  Storage in a NFPA 30 approved flammable storage cabinet with acids and bases separated and placed in compatible secondary containment.

- Poisons (Solids/Liquids)
  Including but not limited to cyanides, arsenic, thallium, etc.

- Oxidizers (Solids/Liquids)
  Including but not limited to nitrates, permanganates, bromates, etc.

- Explosives or Unstable Reactives
  When designated as waste, these compounds should be promptly and properly disposed of.
  Examples include but are not limited to nitroglycerine, picrates, etc.
  UNM does not currently possess authorized explosive storage facilities.

APPENDIX R: PUBLIC EDUCATION AND OUTREACH PROGRAM AND STORM WATER INFORMATION FROM SRS WEBSITE

What is stormwater runoff?

Stormwater runoff is water from rain or melting snow that flows over the land instead of seeping into the ground. In Albuquerque, runoff eventually flows into the Rio Grande.

What is polluted runoff?

Runoff can pick up and carry trash, debris and many substances that pollute water. Some substances in the runoff — such as pesticides, fertilizers, oil and soap, dirt, pet waste, grass clippings and leaves — are the result of human carelessness and can harm the Rio Grande.

What can the average person do to help?

There are many actions an individual can take to help prevent the pollution of stormwater runoff. Most can be done right at home.

For example, pet waste contributes significantly to pollution of the river – picking up after your pets, wrapping the waste in plastic and disposing of it in the garbage can help. In addition, it's important to repair fluid leaks from cars, and to wash cars on grass or at a carwash.

Keep fertilizer, as well as leaves and grass clippings, out of streets and gutters. Avoid littering of any kind – even cigarette butts – especially near a storm drain. Keep lawn and household chemicals sealed tightly and in a place where rain cannot reach them. Dispose of old or unwanted chemicals at household hazardous waste collection sites or events.

To learn more ways you can help, visit our website at **www.keeptheriograng.org.**

MID RIO GRANDE
STORMWATER QUALITY TEAM

Our Mid Rio Grande Stormwater Quality Team Partners

The Stormwater Quality Team was formed in 2004 to educate individuals and businesses about how to reduce stormwater pollution by keeping trash and other pollution out of our stormwater system. The team includes:

- Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA)
- Bernalillo County
- City of Albuquerque
- Ciudad Soil and Water Conservation District (SWCD)
- New Mexico Department of Transportation
- Southern Sandoval County Arroyo Flood Control Authority (SSCAFCA)
- University of New Mexico

You can become a Stormwater Quality Team partner too!

Visit our website today
www.keeptheriograng.org

Help reduce stormwater pollution to...

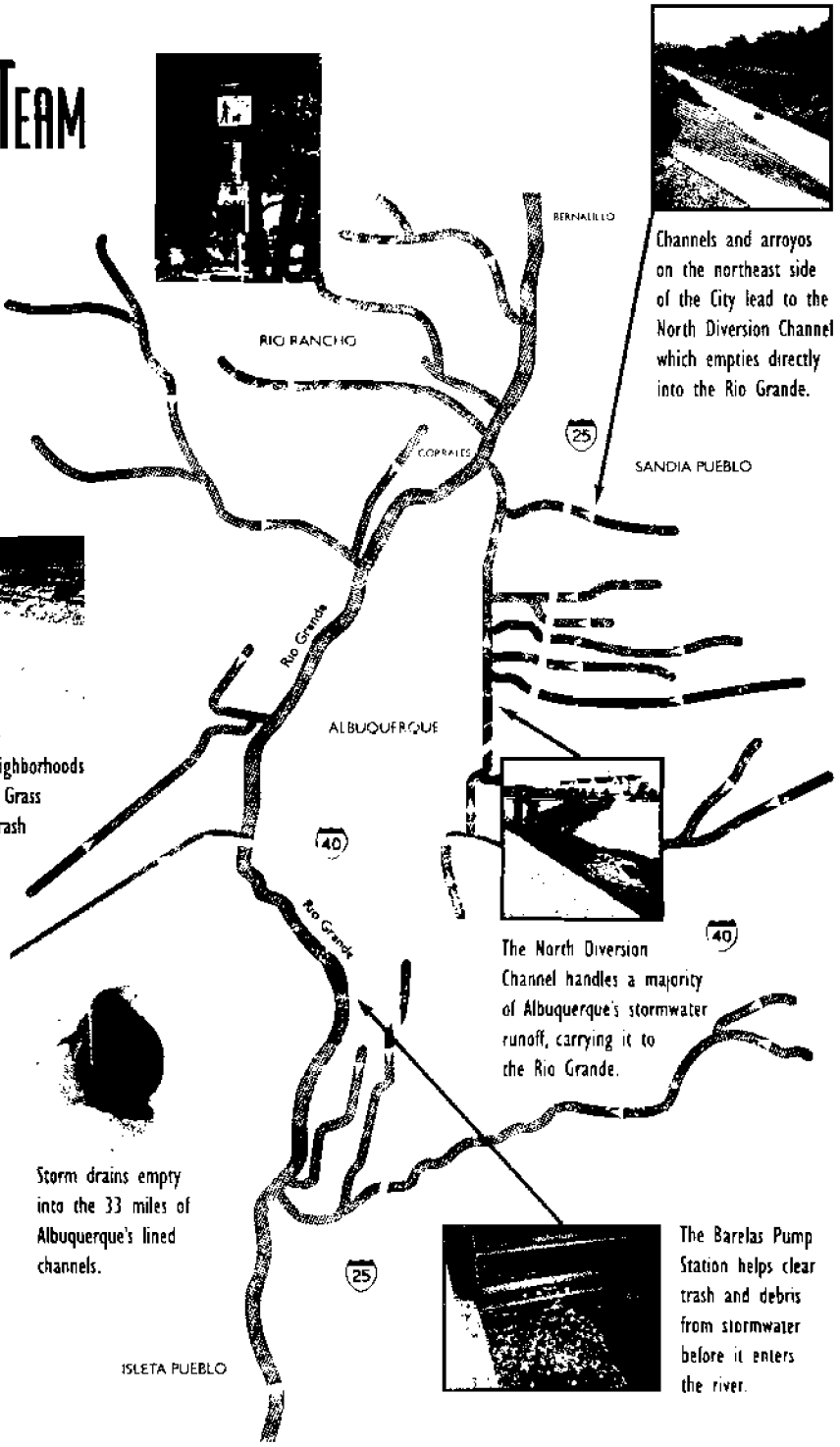
MID RIO GRANDE
STORMWATER QUALITY TEAM

Mid Rio Grande Stormwater Quality Team

How stormwater runoff finds its way to the Rio Grande

Stormwater that does not seep into the ground drains into a system of pipes, channels and arroyos that drains directly into the river.

Storm inlets are found in neighborhoods and other locations citywide. Grass clippings, leaves, pet waste, trash and other debris can wash into a storm inlet, which flows into the city's 722 miles of storm drains.



Channels and arroyos on the northeast side of the City lead to the North Diversion Channel which empties directly into the Rio Grande.

The North Diversion Channel handles a majority of Albuquerque's stormwater runoff, carrying it to the Rio Grande.

Storm drains empty into the 33 miles of Albuquerque's lined channels.

The Barelas Pump Station helps clear trash and debris from stormwater before it enters the river.

Numbers

Within Albuquerque's 188.6 square miles, there are:

- **722 Miles of Storm Drains**
- **33 Miles of Lined Channels**
- **18 Miles of Unlined Arroyos**
- **12,300 Storm Manholes**
- **16,100 Storm Inlets**

Stormwater Pollutants

Here are common stormwater pollutants and their potential sources:

- **Sediment** – Usually one of the largest pollutants produced in cities and towns, sediment is especially found in areas where there is a lot of construction. Many other pollutants often attach to, and are carried by, sediment particles.
- **Nutrients** – Phosphorus and nitrogen are nutrients often associated with stormwater runoff. Nutrients can come from landscaping (commercial and residential), leaks from sanitary sewers and septic systems, and animal waste.
- **Organic Matter** – Sources of organic matter include leaves and grass clippings, animal/pet waste, garbage and litter.
- **Bacteria** – High bacterial levels may be found in stormwater runoff from leaking sanitary systems, garbage, pet waste, etc.
- **Oil and Grease** – Traffic and other activities on roadways produce oil, grease and lubricating agents that are easily transported by stormwater.
- **Toxic Substances** – Metals, pesticides, herbicides and hydrocarbons such as gasoline and methane can get into and be transported by stormwater runoff.
- **Heavy Metals** – Heavy metals such as copper, lead, zinc, arsenic, chromium and cadmium are often found in stormwater runoff polluted by batteries, paints, motor oil and other items.
- **Temperature** – Stormwater runoff becomes warmer as it flows over hard surfaces. Water stored in shallow, unshaded ponds also becomes warmer. Removal of natural plants and trees can open up water bodies to the direct sun. As water warms, it may be harmful or even deadly to some fish and other life in the Rio Grande.

Intergovernmental Agreement Regarding the Operation, Function,

and Funding of the Storm Water Team

THIS AGREEMENT is made and entered into this 27th day of August, 2008, by and among the County of Bernalillo ("COUNTY"), the City of Albuquerque ("COA"), the Albuquerque Metropolitan Arroyo Flood Control Authority ("AMAFCA"), the New Mexico Department of Transportation ("NMDOT"), the Southern Sandoval County Arroyo Flood Control Authority ("SSCAFCA"), and the Ciudad Soil and Water Conservation District ("CIUDAD"), all political subdivisions of the State of New Mexico, and the University of New Mexico ("UNM"), a state educational institution, individually referred to as "Party" and collectively referred to as "Parties."

WITNESSETH:

WHEREAS, the National Pollution Discharge Elimination System (NPDES) storm water discharge permits for small and large municipal separate storm sewer systems ("MS-4") include a minimum control measure regarding public outreach and education; and

WHEREAS, this minimum control measure requires each permittee to develop and distribute educational materials to the community or conduct equivalent public outreach activities about the impacts of storm water discharges on receiving water bodies and the actions that the public can take to reduce pollutants in storm water runoff; and

WHEREAS, COA, AMAFCA, NMDOT, and UNM, co-permittees of a MS-4 Phase I permit, and the COUNTY, a permittee of a Phase II permit, entered into a Cooperative Agreement dated October 20, 2005 in order to accomplish said public outreach and education, and the group informally became known as the Storm Water Team; and

WHEREAS, the Storm Water Team hired a Storm Water Quality Education Coordinator ("Coordinator") to help develop a public education campaign and produce public service announcements including print materials for distribution, and that contract expires November 2008; and

Intergovernmental Agreement Regarding the Operation, Function,

and Funding of the Storm Water Team

WHEREAS, SSCAFCA desires to combine efforts to educate the public on storm water quality as required in their Phase II storm water discharge permit, and to become one of the participating agencies of the Storm Water Team; and

WHEREAS, CIUDAD desires to combine efforts to educate the public on storm water quality as part of their Watershed Restoration Action Strategy, and to become one of the participating agencies of the Storm Water Team; and

WHEREAS, SSCAFCA and CIUDAD both desire to provide funding as part of their membership to the Storm Water Team; and

WHEREAS, each Party has an interest in reducing pollution and/or meeting storm water permit requirements within their respective boundaries, which are shown in Exhibit 1; and

WHEREAS, with new members being added, it is appropriate to enter into this Agreement in order to formalize the Storm Water Team mission and function, and establish future funding streams.

THEREFORE IN CONSIDERATION OF THE PROMISES AND COVENANTS CONTAINED HEREIN, THE PARTIES HERETO AGREE AS FOLLOWS:

1. The Storm Water Team ("Team") will include all members that have signed a Cooperative Funding Agreement, comply with its terms and continue to fund the team. Additional non-voting members will include other agencies, organizations, or individuals that will provide technical assistance needed to allow the Team to accomplish its mission.
2. The Team will serve as the focal point on public education and outreach regarding storm water quality in the Albuquerque Reach of the Rio Grande watershed, which is

the area that drains to the Rio Grande between Algodones and Isleta Pueblo. The Team mission statement is hereby agreed to by the Parties:

The Storm Water Team is a multi-agency committee dedicated to providing public education and awareness regarding storm water pollution and how to reduce debris and other pollutants in the Albuquerque Reach of the Rio Grande and its tributary arroyos.

3. The Team will have an Executive Committee made up of one voting member from each Party in good standing, which is defined as having paid their expected contribution, as described in Section 4. Each Party in good standing will designate a staff member to be on the Executive Committee. Other staff liaisons will be assigned to the Team as necessary to support the Team mission. Other/outside agencies may participate on the Team by attending meetings and giving input; however, only the Executive Committee may vote on Team decisions. The purpose of the Executive Committee will be to administer and direct the Team and Coordinator in accordance with the provisions herein. Decisions of the Executive Committee will be decided by majority vote of the Executive Committee.

4. Each Party agrees to provide payment for Fiscal Year 2009 in the amount shown in the Contribution Schedule, which may include the value of Executive Committee approved in-kind services, in Attachment A. For subsequent Fiscal Years, the Contribution Schedule may be adjusted by the Executive Committee, including the value of in-kind contributions.

5. AMAFCA will be the fiscal agent for the purposes of this Agreement. All funds will be held in a separate bank account for the purposes of this Agreement. AMAFCA shall make available to any interested Party, all records, receipts, and other

documentation with respect to all matters concerning this Agreement, and shall have this account included in its annual audit.

6. Each Party agrees that a Storm Water Quality Education Coordinator will be hired through the Request for Proposal (RFP) process in advance of the expiration of the current Coordinator's contract. The Coordinator shall be a contractor and not an employee of AMAFCA. Responsibilities included in the Storm Water Quality Education Coordination contract will be to develop and manage a comprehensive educational and awareness campaign, arrange all purchases for deliverables and advertising on behalf of the Team, and make presentations to the public as directed. Each Party will have one representative on the Selection Advisory Committee for the request for proposals process. The Selection Advisory Committee will rank proposals and recommend the top three respondents to the AMAFCA Board of Directors. Upon AMAFCA Board of Directors' approval, AMAFCA will negotiate an agreement with the selected consultant. The Executive Committee will provide input on scope and fees; however, final negotiations and approval will be at AMAFCA's sole discretion.

7. The Parties agree that the Storm Water Quality Education Coordination contract is an ongoing program. The effectiveness of the Storm Water Quality Education Coordination contract, with regard to the Team mission statement, will be evaluated prior to annual renewal(s) or request for proposals.

8. AMAFCA will invoice each Party for their respective participation, minus the value of any Executive Committee approved in-kind contributions, in July, at the start of the Fiscal Year. Each Party will pay such invoices to AMAFCA within forty-five

(45) days of the date of the invoice. Invoices will be sent to Team members listed in Attachment B.

9. It is intended that the Team's operation and function described in this Agreement are ongoing, subject to continued support and authorized funding by each of the Parties. Each Party has the option to not participate in this Agreement in the future by sending written notice to all the other participating Parties at or before the expiration of the Fiscal Year. In such event, the terminating Party shall not be entitled to return of any contribution(s) made under this Agreement; and this Agreement shall remain in full force and effect by and among the remaining Parties.

10. The Team may accept one-time contributions from outside funding sources, to be used to support the Team mission. The Executive Committee will consider the requested uses of such one-time contributions and will ensure the uses are consistent with the Team's ongoing public outreach and education program. Such contributions shall not constitute voting privileges on the Executive Committee.

11. The Parties agree that effort will be expended within the respective boundaries of each participating agency, proportional to funding contributions.

12. If any situation arises which adversely affects any Party's participation in this Agreement, said Party will immediately, and in writing, notify the other Parties. Any circumstance that materially affects this Agreement will be promptly and equitably resolved by all Parties and if necessary, an amendment to this Agreement shall be executed.

13. The obligations of each Party under this Agreement shall be performed in compliance with all applicable laws, statutes and ordinances. Nothing herein is intended to

constitute any agreement for the Parties to perform any activity in violation of the Constitution or Laws of the State of New Mexico or the Ordinances of any entity that is a Party to this Agreement.

14. If any clause or provision in this Agreement is illegal, invalid or unenforceable, under present or future laws effective during the term of this Agreement, then and in that event, it is the intention of the parties hereto that the remainder of this Agreement shall not be affected thereby.

15. It is specifically agreed among the Parties that this Agreement does not, and is not intended to, create in the public, or any member thereof, any rights whatsoever, such as but not limited to, the rights of a third Party beneficiary, nor to authorize anyone not a Party to this Agreement to maintain a suit for wrongful death or any other claim whatsoever.

16. As among the Parties, each shall be solely responsible for any and all liability from personal injury, including death, or damage to property, arising from any negligent or intentional act or failure to act of the respective Party, its officials, agents, contractors or employees pursuant to this Agreement. Liabilities of each Party shall be subject to the immunities and limitations of the Tort Claims Act, §§41-4-1, et seq., NMSA, 1978, and any amendments thereto. By entering into this Agreement, the COUNTY and its "public employees" as defined in the New Mexico Tort Claims Act, the COA and its "public employees" as defined in the New Mexico Tort Claims Act, AMAFCA and its "public employees" as defined in the New Mexico Tort Claims Act, NMDOT and its "public employees" as defined in the New Mexico Tort Claims Act, UNM and its "public employees" as defined in the New Mexico Tort Claims

Act, SSCAFCA and its "public employees" as defined in the New Mexico Tort Claims Act, and CIUDAD and its "public employees" as defined in the New Mexico Tort Claims Act, do not waive sovereign immunity, do not waive any defense and/or do not waive any limitation of liability pursuant to law. No provision in this Agreement modifies and/or waives any provision of the New Mexico Tort Claims Act.

17. The effective date of this Agreement shall be the latest date of approval by all of the interested Parties.

18. Upon approval by all Parties, the covenants, terms and conditions of this Agreement shall be binding upon and inure to the benefit of the Parties hereto, their successors and assigns.

IN WITNESS WHEREOF, the undersigned have caused this Agreement to be executed as of the day and year set forth above.

Albuquerque Metropolitan Arroyo Flood Control Authority

Date: March 20, 2008

Danny Hernandez
Chair of the Board of Directors

Attest:

Tim Eichenberg,
Secretary/Treasurer

Date: March 20, 2008

County of Bernalillo

Date: 5/21/08

Thaddeus Lucero, County Manager

Approved As To Form Only:

Deborah Seligman,
Assistant County Attorney

Date: 5/19/2008

Recommended By:

Tom Zdunek
~~XXXXXXX~~, Deputy County Manager
Public Works Division

Date: 5/21/08

BC CCN 2008-0264

Intergovernmental Agreement Regarding the Operation, Function,

and Funding of the Storm Water Team

City of Albuquerque

Approved As To Form Only:

_____

City Attorney

Date: 5-12-8

Recommended By:

_____

John Castillo, Director

Date: 5/13/08

Approved By:

_____

Dr. Bruce Perlman, Chief Administrative Officer

Date: 5/16/08

University of New Mexico

Recommended By:

Donna K. Smith
Director, Safety & Risk Services

Date: 4-23-8

Approved As To Form Only:

Richard Mertz
Associate University Counsel

Date: 4/29/08

Approved By:

David W. Harris
Executive Vice President for Administration

Date: 5/1/08

Intergovernmental Agreement Regarding the Operation, Function,

and Funding of the Storm Water Team

New Mexico Department of Transportation

Approved As To Form Only:

G Chappelle

Office of the General Counsel

Date: 5/22/08

Approved By:

Larry Velasquez, NMDOT District Three Engineer

Date: 8/26/08

Intergovernmental Agreement Regarding the Operation, Function,

and Funding of the Storm Water Team

Ciudad Soil and Water Conservation District

Date: 4-12-08

Lauro Silva, Chair

Approved as to Form:

Bernard P. Metzgar
SSCAFCA Attorney

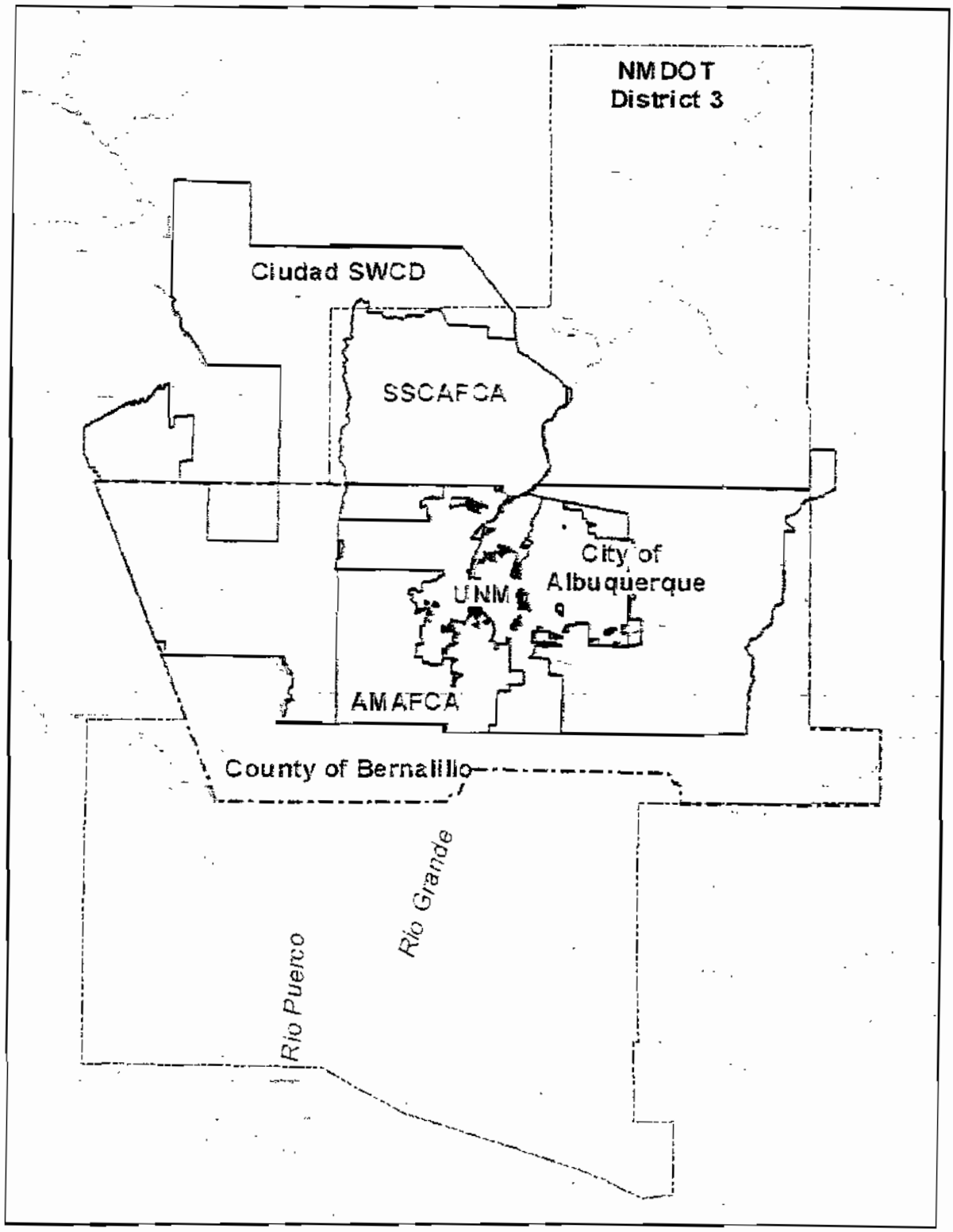
Date: 4/18/08

Southern Sandoval County
Arroyo Flood Control Authority

Date: 5/02/08

John Chaney, Chairman

Exhibit 1
Boundaries of Participating Agencies



Intergovernmental Agreement Regarding the Operation, Function,

and Funding of the Storm Water Team

Storm Water Team Intergovernmental Agreement – Attachment A

STORM WATER TEAM CONTRIBUTIONS

		Date received by AMAFCA	
FY 05			
AMAFCA	$10,000	12/01/2004	
City of Albuquerque	10,000	04/28/2005	
County of Bernalillo	10,000	12/02/2004	
UNM	7,000*	07/19/2005	* $5,000 in cash, $2,000 in KNME video
NMDOT	10,000	05/26/2005	
Total	**$47,000**		
FY 06			
AMAFCA	$10,000	12/23/2005	
City of Albuquerque	10,000	01/23/2006	
County of Bernalillo	10,000	06/29/2006	
UNM	7,000	02/02/2006	
NMDOT	10,000	06/29/2006	
Total	**$47,000**		
FY 07			
AMAFCA	$10,000	03/21/2007	
City of Albuquerque	10,000	06/13/2007	
County of Bernalillo	10,000	02/11/2008	
UNM	7,000	05/22/2007	
NMDOT	10,000	04/02/2008	
Total	**$47,000**		
FY 08			
AMAFCA	$10,000	10/03/2007	
City of Albuquerque	10,000	09/25/2007	
County of Bernalillo	10,000	03/18/2008	
UNM	7,000	12/10/2007	
NMDOT	10,000	04/02/2008	
Total	**$47,000**		
FY 09 Expected Contributions			
AMAFCA	$10,000		
City of Albuquerque	10,000		
County of Bernalillo	10,000		
UNM	7,000		
NMDOT	10,000		
SSCAFCA	10,000		
Ciudad	10,000		
Total	**$67,000**		

Storm Water Team Intergovernmental Agreement – Attachment B

STORM WATER TEAM CONTACT ADDRESSES

Christy Burton
AMAFCA
2600 Prospect Ave NE
Albuquerque, NM 87107

cc Irene Jeffries (same address)
on invoices

Storm Drainage Section
Dept. of Municipal Development
Attn: Kathy Verhage
P.O. Box 1293, Rm. 301
Albuquerque, NM 87103

cc Roland Penttila (same address)
on invoices

Vern Hershberger
Safety & Risk Services
1 University of New Mexico
MSC07 4100
Albuquerque, NM 87131

Send original invoices to:
Accounts Payable
1 University of New Mexico
MSC01 1290
Albuquerque, NM 87131

Carol Moritz, Administrative Manager
Ciudad Soil & Water Conservation District
6200 Jefferson NE, Room 125
Albuquerque, NM 87109

Kathy Trujillo
New Mexico Department of Transportation
District 3
PO Box 91750
Albuquerque, NM 87199-1750

Patricia Dominguez
Bernalillo County
Public Works Division
2400 Broadway Blvd SE
Bldg N
Albuquerque, NM 87102

cc Mary Murnane (same address)
on invoices

David Stoliker
SSCAFCA
1041 Commerical N.E.
Rio Rancho, New Mexico 87124

The University of New Mexico

Risk Management And

Safety, Health and Environmental Affairs

STORM WATER POLLUTION PREVENTION AT UNM

SHEA would like your help in keeping the storm water that flows off the campus as clean as possible. This article will summarize what the issues are and how you can help UNM to be a good neighbor for the environment.

Similar to most metropolitan areas, nearly all storm water in the Albuquerque area flows to the Rio Grande River without any treatment. Therefore, the best approach is to keep materials that may harm the river from being flushed away by storm water. The following list of materials will negatively impact the river if flushed away with storm water:

*Hazardous Chemicals, including automotive fluids, e.g., gasoline, oil, coolant, transmission and brake fluids, etc.;
*Litter, e.g., paper and plastic trash and to a lesser extent leaves and plant materials;
*Loose/Disturbed Soil, e.g., from construction sites;
*Animal Wastes, especially dog droppings; and,
*Construction and artwork materials, especially paint, paint rinse water, paint thinners and powders, e.g., lime.

How You Can Help

We live in an arid climate and therefore, do not often have to plan for rain or consider what will happen if it rains. Therefore, we need to develop an active consciousness that considers, "*What will happen if it rains?*" The following measures will help UNM to remain a good environmental steward in this regard:

1. Have your vehicle properly repaired and maintained to prevent fluid leaks while parked at UNM. Better yet, ride a bike, car-pool, take the bus, etc. Performing oil changes or other significant automotive repair or maintenance work on campus outside of the proper facilities, e.g., the PPD Automotive Center, is forbidden by UNM policy;
2. Pick up litter and put it in a trash receptacle;
3. Bring bags/containers to pick up and properly dispose of your dog's droppings as you walk or jog on campus;
4. Wash water-based paint out of brushes, etc., in a sink that drains to the sanitary sewer;
5. Oil-based paints and thinners, as with nearly all hazardous materials and wastes cannot be dumped any-where (e.g., down the drain, on the ground or in the trash). They must be containerized, labeled and disposed of through SHEA for all UNM operations. Contact SHEA for advice on disposal options for non-UNM generated wastes as well; and
6. If you see a significant automotive fluid leak, someone changing/dumping their oil on campus, or any activities on campus including construction work that threaten storm water, please promptly contact SHEA at 277-2753. Please do not report oil stains/drips on pavement since asphalt fortunately absorbs lubricating oils and storm water will not readily flush it away.

To carry this a step further, if you see a friend or neighbor doing something that could pollute UNM storm water, e.g., littering or not picking up their dog's droppings while on campus, please politely educate them. Additionally, if you or a campus environmental advocacy group would like to further help SHEA's storm water pollution prevention efforts, please contact Vern Hershberger at 277-2753.

COPY

STORM WATER TEAM
INVOICE
FY 2009

September 16, 2008

TO: Accounts Payable
1 University of New Mexico
MSC01 1290
Albuquerque, NM 87131

University of New Mexico contribution to
Storm Water Team for FY 2009: $7,000.00

9/26

Please make check to AMAFCA and remit to:

AMAFCA
Storm Water Team
2600 Prospect Avenue NE
Albuquerque, NM 87107

Thank you!

Danny Hernandez - Chair
Janet Saiers - Vice Chair
Tim Eichenberg - Secretary - Treasurer
Ronald D. Brown - Assistant Secretary - Treasurer
Daniel Lyon - Director

John P. Kelly, P.E.
Executive Engineer

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority
2600 Prospect N.E., Albuquerque, NM 87107
Phone: (505) 884-2215 Fax: (505) 884-0214

September 16, 2008

Vern Hershberger
Safety & Risk Services
1 University of New Mexico
MSC07 4100
Albuquerque, NM 87131

Re: Intergovernmental Agreement Regarding the Operation, Function, and Funding of the Storm Water Team

Dear Mr. Hershberger:

Enclosed are a fully-executed original of the above-named agreement, and a copy of the invoice for the University of New Mexico's $7,000 contribution to the Storm Water Team for FY 2009, pursuant to Attachment A of the agreement.

The original invoice has been sent to Accounts Payable at the University, as specified in the Agreement.

If you have any questions, please contact me at 884-2215.

Sincerely,
AMAFCA

Pam Woodruff

Pamela S. Woodruff
Executive Secretary

Encls.

APPENDIX T: BACTERIA TMDL INFORMATION

CITY OF ALBUQUERQUE

THREE HUNDRED YEARS 1706 • 2006
ALBUQUERQUE
Making History

November 27, 2007

Ms. Sonia Hall
U.S. EPA, Region 6
Water Enforcement Branch (6EN-WC)
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Albuquerque Municipal Separate Storm Sewer System Permit No. NMS000101

As per Tables III.A, B of the above mentioned MS4 Permit, the following progress items having a December 1, 2007 due date are here-by submitted for the City of Albuquerque (COA), the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA), the New Mexico Department of Transportation (NMDOT), and the University of New Mexico (UNM):

A. ***Table III.B – Activity 11.0 – BMP Assessment:*** See attached draft report to be made available for public comment and review. The final report will be submitted on June 1, 2008.
B. ***Table III.B – Activity 12.0 – Annual TMDL Progress Reports:*** See attached report.

If you need any further information, please contact Kathy Verhage of my staff at 505-768-3654.

Sincerely,

Dan Hogan, P.E., P.S.
Manager, Storm Drainage Division

Attachments

cc: John Kelly, AMAFCA
Vern Hershberger, UNM
Larry Velasquez, NMDOT, District 3
Kathy Trujillo, NMDOT, District 3

P.O. Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

A. Table III.B – Activity 11.0

Draft BMP Assessment

CITY OF ALBUQUERQUE

November 27, 2007

Ms. Sonia Hall
U.S. EPA, Region 6
Water Enforcement Branch (6EN-WC)
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Albuquerque Municipal Separate Storm Sewer System Permit No. NMS000101
DRAFT Best Management Practices (BMP) Assessment

As per Table III.B, Activity 11. of the above mentioned MS4 Permit, the following is a draft report providing an evaluation and assessment of the effectiveness of Best Management Practices (BMP) implemented by the MS4 partners to comply with fecal coliform Total Maximum Daily Loadings (TMDL). This draft report assesses the effectiveness of the BMPs as described in Table III.B. Activity 9 of the MS4 Permit.

In order to determine which BMPs would be most effective in reducing fecal coliform TMDL, the City of Albuquerque (COA) and Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) first conducted two intensive investigations to determine the source of fecal coliform in storm water from the Albuquerque Metro Area. Both the antibiotic resistance analysis method and the DNA source tracking method were used to identify the source of fecal coliform contamination by watershed. The results of both studies, the Antibiotic Resistance Analysis of Contamination in Storm Water (ARA) Study (Camp. Dresser, and McKee, 2001) and the DNA Bacteria Source Tracking (BST) Study (Parsons Water & Infrastructure, 2005), indicate the major sources of fecal coliform contamination as coming from birds (46%), dogs (24%), and human/sewage (16%).

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

The COA conducted a field study to further examine the source of fecal coliform contamination attributed to human/sewage in the BST. An intense dry weather screening of the storm water outfalls was performed to analyze the presence of human/sewage flows. These dry weather screenings have proven to be negative and it appears that the source of the indicated human/sewage contamination results from the contact of storm water with material in dumpsters or "dumpster juice" and not cross-connections of sanitary sewer lines. To deal with contamination due to "dumpster juice", the COA implemented a City Ordinance (Volume II, Chapter 22, Section 8, Development Process Manual) cited in the 2005 annual report. This ordinance mandates the use of structural controls for new development projects that historically have had the potential to generate the most serious post storm water pollution problems

As described in the "Revised Procedures to Prevent Discharge of Pollutants from Sanitary Sewers in the MS4 System" submitted in the May 2005 Progress Report (Table IIIA, Activity 9), true cross connections are very infrequent. More commonly, breaks in sanitary lines that have been sleeved through larger diameter storm sewer occur. Storm Drainage Division works with Sanitary System Sewer Department to replace and reroute the sanitary sewer line as needed. In addition, engineers between the two departments coordinate the replacement of adjacent sanitary sewers during the construction of any new storm sewer installation.

The COA, AMAFCA, and the New Mexico Department of Transportation (NMDOT) have also developed and instituted innovative technologies for the improvement of storm water quality. As presented in "Criteria and Procedures to Assess the Feasibility of Adding Storm Water Quality Features to New/Existing Flood Control Facilities Controlled by COA/AMAFCA/ NMDOT" in the May 2005 Progress Report (Table IIIA, Activities 6a & 6b), these partners have worked together to install debris control facilities on principal spillways of new and existing flood control structures and retrofitted existing debris control facilities to

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remove a higher percentage of floating debris. AMAFCA and the COA also completed a study of gross pollutants in the Albuquerque Metro Area entitled "AMAFCA/Albuquerque MS4 Floatable & Gross Pollutant Study" (ASCG, Inc., 2005). Although the results of the study are inconclusive with regards to the effect of floatables/debris reduction on bacterial loading, the reduction of floatables/debris was shown to significantly improve water quality in general.

After reviewing the indicated fecal coliform sources in the ARA and BST studies, the MS4 co-permitees decided that education, enforcement of existing ordinances, and implementation of new ordinances, as needed, were the best methods to reduce fecal coliform sources and prevent future fecal discharges. As proposed in the MS4 Fecal Coliform Reduction Program submitted in May 2005, raising the public's level of knowledge about the hazards of pet waste and the enforcement of existing pet waste disposal became the cornerstone.

Specific activities taken to increase the public's awareness of the fecal coliform problem have included forming a partnership with the County of Bernalillo to implement a watershed-wide public information program targeted at the control of dog feces and other pollutant sources in the Middle Rio Grande Watershed. Since 2004, contracts ranging in value from $47,000/year to $50,000/year have been awarded to a local public relations firm to assist in developing a comprehensive program to reduce storm water pollution from pet waste and trash. This "Scoop the Poop" program was initiated with an advertising campaign using TV and radio spots and billboards to target dog feces and trash as unwanted storm water pollutants. Television and radio spots continue to be broadcast and a public relations firm is currently working on a short video presentation to appeal to school-age groups.

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The MS4 partners have also printed educational brochures discussing the ramifications of improper pet waste and trash disposal and emphasizing proper disposal practices. These brochures are handed out at the state fair and other community events. The COA also distributes these brochures in response to citizen complaints regarding improper disposal of pet waste or other potentially hazardous materials received via the City's "311" Hotline.

The COA Storm Water Drainage Division and AMAFCA also work with COA Open Space Division and COA Parks & Recreation Department to install plastic bag dispensers at Open Space Trailheads and at specific park locations to encourage pet owners to properly dispose of waste. Neighborhood Associations are involved in the public outreach program since the dispensers are installed at their request.

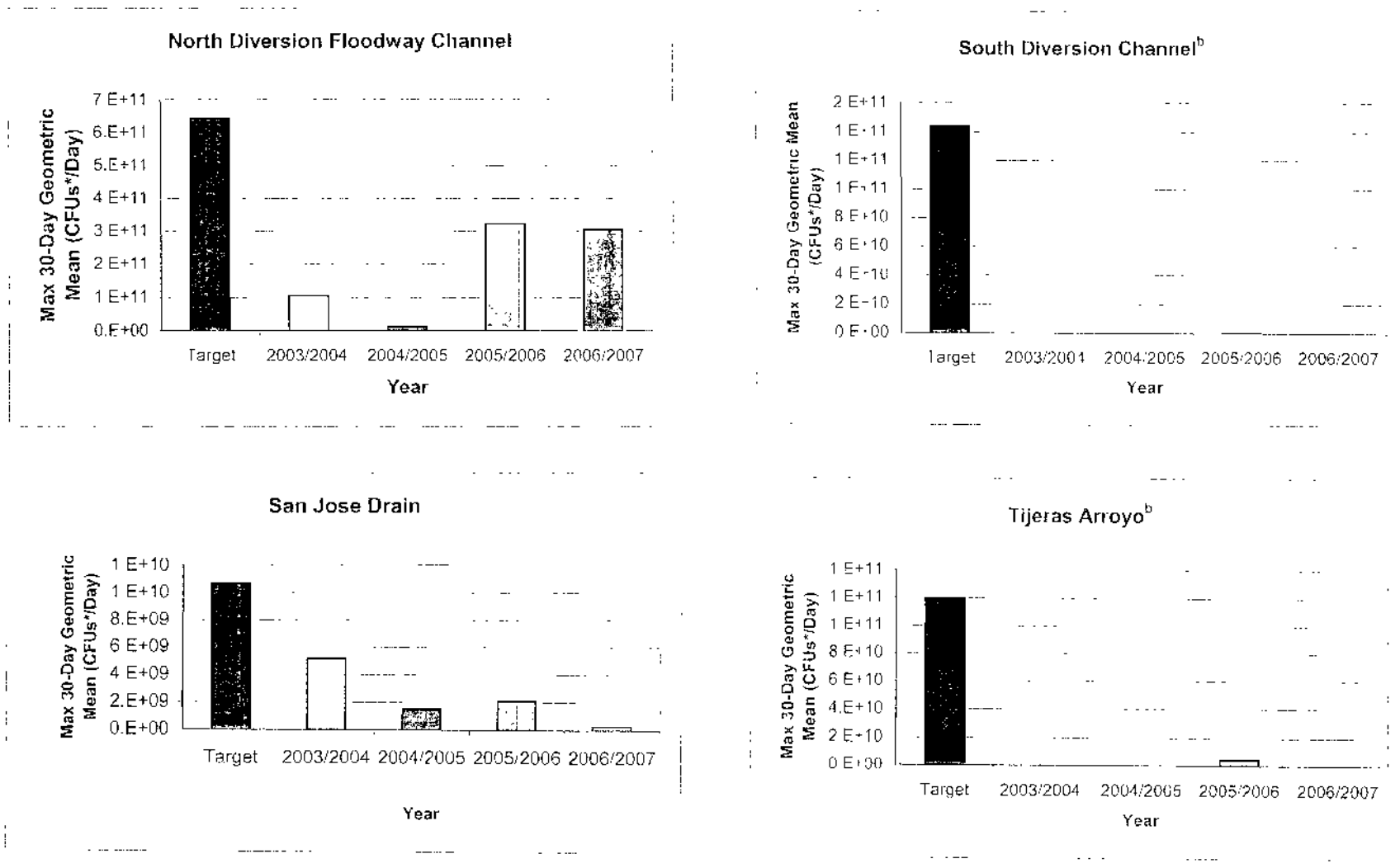
The attached TMDL loading calculations for the past four years in terms of the 30-day maximum geometric mean, provided by the USGS, are summarized in Table 1 and depicted graphically in Figures 1 through 3. Figure 1 shows the maximum 30-day geometric mean in comparison to the target value while Figure 2 presents the log of these values. Figure 3 depicts the maximum 30-day geometric mean as a percentage of the target value. These results show that the co-permittees of the Albuquerque MS4 Storm Water Permit are currently well within the target goals of the fecal coliform TMDL stated in the permit. Because these results indicate that our current BMPs are effective in reducing and/or treating fecal coliform sources and we suggest that no changes be made to our BMPs at this time.

Dan Hogan, P.E., P.S.
Manager, Storm Drainage Division
City of Albuquerque

Table 1. Fecal Coliform Total Maximum Daily Loading (TMDL) Results for 2003 through 2006

	30-day Geometric Mean, cfu/day				
Conveyance	Target	2003 - 2004	2004 - 2005	2005 - 2006	2006 - 2007
North Diversion Floodway Channel	6.438×10^{11}	1.05×10^{11}	1.24×10^{10}	3.21×10^{11}	3.05×10^{11}
San Jose Drain	1.068×10^{10}	5.12×10^{9}	1.54×10^{9}	2.10×10^{9}	2.71×10^{8}
South Diversion Channel	1.444×10^{11}	3.69×10^{7}	3.9×10^{7}	4.85×10^{8}	1.67×10^{7}
Tijeras Arroyo	1.199×10^{11}	2.43×10^{5}	3.4×10^{6}	4.74×10^{9}	9.23×10^{6}

Figure 1. Fecal Coliform Total Maximum Daily Loads (TMDLs)
Max 30-Day Geometric Mean (CFUs[a]/Day)



[a]CFU = Colony Forming Unit

[b]Yearly values compared to target values are orders of magnitude lower

Figure 2. Fecal Coliform Total Maximum Daily Loads (TMDLs) for Years 2003-2007
Log Max 30-Day Geometric Mean
(Colony Forming Units [CFU]/Day)

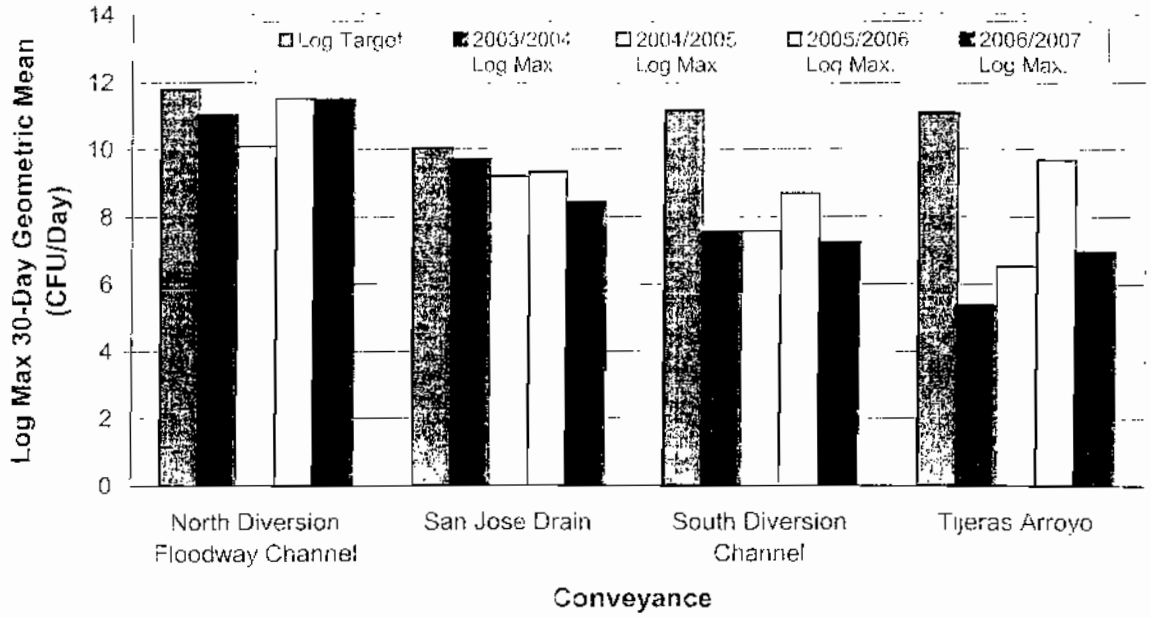
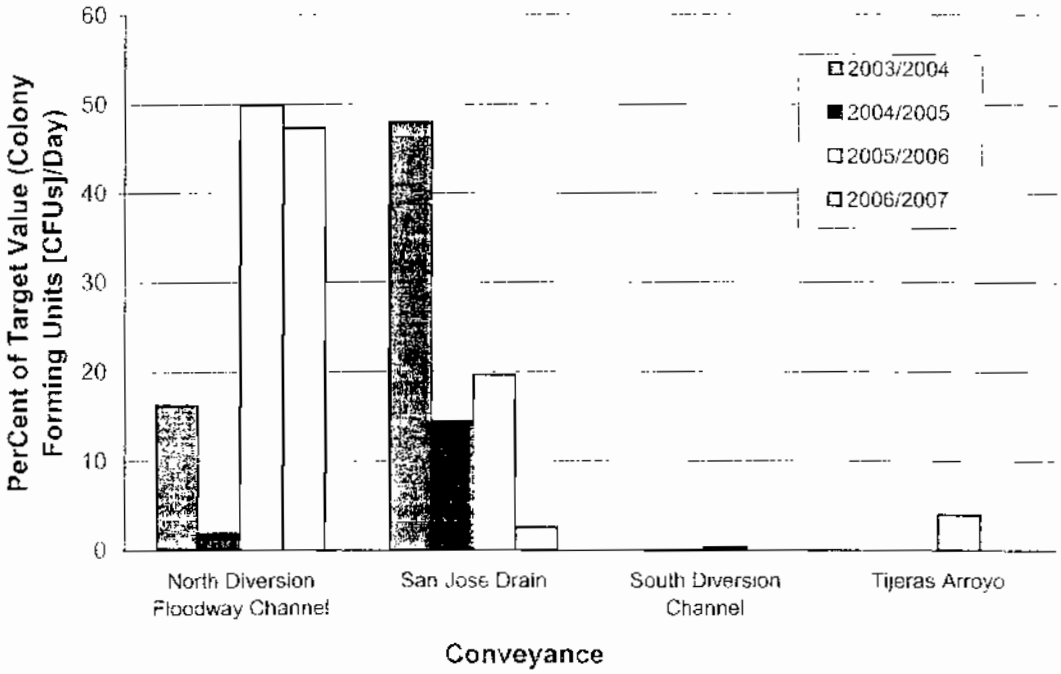


Figure 3. Fecal Coliform Results as PerCent of Target Total Maximum Daily Load (TMDL)



B. Table III.B – Activity 12.0

Annual TMDL Progress Report

November 27 2007

Ms. Sonia Hall
U.S. EPA, Region 6
Water Enforcement Branch (6EN-WC)
1445 Ross Avenue
Dallas, Texas 75202-2733

RE: Albuquerque Municipal Separate Storm Sewer System (MS4) Permit No. NMS000101 TMDL Progress Report

As per Table III.B, Activity 12, of the above mentioned MS4 Permit, the following is a summary of the progress made by all of the co-permittees to comply with the Fecal Coliform TMDL of the permit.

The DNA Bacteria Source Tracking (BST) Study, made available to the public in 2006, indicates the major sources of fecal coliform contamination as coming from birds (46%), dogs (24%), and human/sewage (16%). The City of Albuquerque (COA) has done an intense dry weather screening of the storm water outfalls noted in the BST Study to analyze the presence of human/sewage flows. These dry weather screenings have proven to be negative and it appears that the source of the indicated human/sewage contamination is storm water that has been contaminated by contact with dumpster contents or "dumpster juice" and not cross-connections of sanitary sewer lines. Contamination due to "dumpster juice" continues to be mitigated through implementation of the City Ordinance cited in last year's annual report.

Because the fecal coliform contamination appears to be a watershed-wide problem, the MS4 co-permittees continue to work with the County of Bernalillo to implement a watershed-wide public information program, targeted at the control of dog feces and other pollutant sources in the Middle Rio Grande Watershed. This year, as in previous years, a $47,000 contract has been awarded to a local public relations firm and a public information program has been implemented to reduce fecal coliform contamination. This program has emphasized the use of TV and radio spots and billboards to target dog feces and trash as unwanted storm water pollutants.

The MS4 co-permittees and the County of Bernalillo also continue to reduce fecal coliform contamination through the "Scoop the Poop" educational program. A one-page informational brochure was recently prepared by the educational partners and distributed at the state fair to increase public awareness of problems associated with improper pet waste disposal. These brochures are also distributed in local neighborhoods in response to public requests and complaints regarding pet waste issues. Additional plastic bag dispensers have been placed at City Parks and Open Space Areas at public request, particularly in areas where dog walking is prevalent.

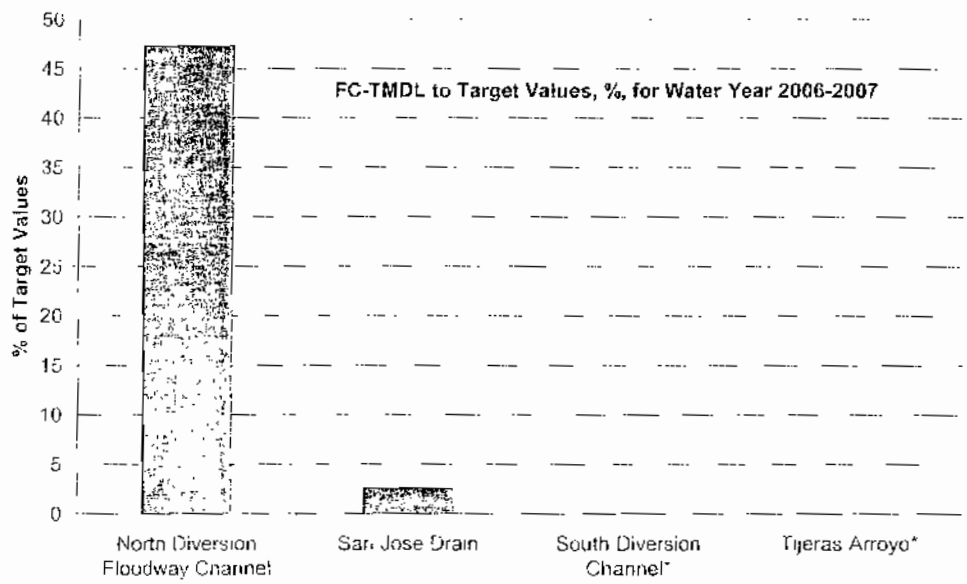
The attached TMDL loading calculations, provided by the USGS, show that the co-permittees of the Albuquerque MS4 Storm Water Permit are currently well within the target goals of the fecal coliform TMDL stated in the permit. Loadings in all conveyances, particularly those to the south, decreased compared to last year's values, most likely due to the lower runoff obtained during this year's monsoon season.

Dan Hogan, P.E., P.S.
Manager, Storm Drainage Division
City of Albuquerque

Fecal Coliform Total Maximum Daily Loading (TMDL)

	30-day Geometric Mean, cfu/day				
Conveyance	Target	2003 - 2004	2004 - 2005	2005 - 2006	2006 - 2007
North Diversion Floodway Channel	6.438×10^{11}	1.05×10^{11}	1.24×10^{10}	3.21×10^{11}	3.05×10^{11}
San Jose Drain	1.068×10^{10}	5.12×10^{9}	1.54×10^{9}	2.10×10^{9}	2.71×10^{8}
South Diversion Channel	1.444×10^{11}	3.69×10^{7}	3.9×10^{7}	4.85×10^{8}	1.67×10^{7}
Tijeras Arroyo	1.199×10^{11}	2.43×10^{5}	3.4×10^{6}	4.74×10^{9}	9.23×10^{6}

cfu : Colony Forming Units



*% of Target Value to those conveyances is essentially zero

Annual Calculation of TMDL Loading
2006-2007 - GEOMETRIC MEAN

Month	San Jose Drain	Tijeras Arroyo	South Diversion Channel	North Diversion Floodway Channel
Jan 2007	4.956E+07	2.327E+06	3.862E+05	1.536E+09
Feb 2007	7.842E+07	1.651E+06	6.055E+05	3.296E+09
Mar 2007	7.353E+07	4.310E+05	9.063E+05	1.921E+09
Apr 2007	8.618E+07	1.329E+05	1.403E+06	3.743E+09
May 2007	2.706E+08	9.231E+06	1.673E+07	4.479E+09
Jun 2007	6.669E+07	1.004E+06	2.104E+06	1.449E+09
Jul 2007	2.692E+08	1.760E+06	8.548E+06	3.048E+10
Aug 2007	2.545E+08	2.509E+06	1.477E+06	1.214E+10
Sept 2007	1.262E+08	8.080E+05	5.183E+05	2.261E+09
Oct 2006	1.397E+08	9.331E+05	1.834E+06	5.042E+09
Nov 2006	4.778E+07	2.746E+06	2.450E+05	8.505E+08
Dec 2006	5.356E+07	5.615E+05	2.450E+05	9.753E+08

PROPOSED PROGRAM FOR REDUCING/TREATING EXISTING FECAL COLIFORM SOURCES AND FOR THE PREVENTION OF FUTURE FECAL DISCHARGES IN THE ALBUQUERQUE MS4

BACKGROUND

The COA and AMAFCA have conducted 2 intensive investigations of fecal coliform sources in the Albuquerque Metro Area, using both the Antibiotic Resistance Analysis (ARA) method and the DNA Source Tracking Method.

Both of these studies analyzed the fecal coliform sources by watershed and by fecal source. The results from both of these studies revealed that the major sources of fecal coliform of storm water in the Albuquerue Metro Area are from birds and dogs. Both studies also infer that there may be some cross contamination of the base samples that reflect human sewage as another source, but field testing of the named sites by AMAFCA and the COA reveal that human feces are not a major source of fecal coliform contamination of storm water runoff.

After reviewing the indicated fecal coliform sources in the above mentioned studies, by both watershed size and density, it was determined that the following measures, suggested in the MS4 Permit Activities, ***would not*** be feasible or needed to address the indicated fecal contamination problem:

- Rehabilitate failing septic systems
- Connect failing septic systems to sewer
- Increase septic system clean outs
- Retrofit storm water ponds
- Retrofit ditches as dry swales
- Waterfowl management
- Install recreational vehicle sewage pumpouts
- Implement conservation plans at hobby farms
- Eliminate illicit connections to storm sewer
- Rehabilitate existing sewer system to eliminate sanitary sewer overflows
- Relocate storm outfalls
- Disinfect at the end of pipe
- Land Use Management
- Stringent septic system requirements
- Stream/ditch buffers and access restrictions
- Livestock fencing
- Wildlife control
- Land application criteria for biosolids
- Strom water treatment for new development

- Increased testing of new sewers
- Increased inspections of new sewer hookups
- SSO monitoring and prevention
- Optimal storm water outfall locations
- Transient sewage disposal
- Septic system rehabilitation

The one emphasis item, which will become the cornerstone of the MS4 Fecal Coliform Reduction Program, is to ***raise the public's level of knowledge about the hazards of pet waste*** and the enforcement of existing pet waste disposal ordinances.

To increase the public's awareness of the fecal coliform problem, the MS4 co-permittees have taken the following positive actions:

ACTION ITEMS

1. The COA, AMAFCA, NMDOT and UNM and Bernalillo County have provided cooperative funding for a public awareness campaign to reduce storm water contamination from pet wastes.

2. Completed award of public information contract to Cooney, Watson & Associates to develop comprehensive program to reduce storm water pollution from pet waste in the Albuquerque Metro Area.

3. Developed cooperative partnership with Bernalillo County to decrease fecal coliform sources in storm water.

4. Developed working partnership with the COA Open Space Division to install "Mutt Mitt" dispensers at Open Space Trailheads and at specific park locations.

5. Developed working partnership with the Ciudad Soil & Water Conservation District to decrease fecal coliform contamination in the Middle Rio Grande Watershed

6. Provided Cooney & Watson with video footage of storm water runoff problems.

7. Conducted public outreach session with Albuquerque Neighbor Coalition Members regarding degree of pet waste problem and obtained buy-in on proposed campaign mascot and slogan (Scoop the Poop).

8. Approved TV and radio spots for kick-off of "Scoop the Poop" campaign.

9. Obtained buy-in on "Scoop the Poop" campaign from the Office of the Mayor of Albuquerque and the COA Parks & Recreation Department.

10. Obtained commitment from the Mayor of Albuquerque to participate in kick-off of "Scoop the Poop" campaign.

11. By May 15, 2005; Initiate "Scoop the Poop" advertising campaign using both TV and radio spots.

12. By July 1,2005; Install "Scoop the Poop" billboard advertising at AMAFCA supplied billboard sites.

13. By December 1, 2005; Assist Ciudad Soil & Watershed Conservation District obtain additional state funding for implementation of additional public information items regarding fecal coliform contamination of storm water.

Table 3.B.2
Numeric Target Values for Storm water Conveyances[1]

Conveyance	(30-day geometric mean)
North Diversion Floodway Channel	6.156x10[illegible] cfu/day
San Jose Drain	[illegible].968x10[illegible] cfu/day
South Diversion Channel	1.144x10[illegible] cfu/day
Tijeras Arroyo	1.199x10[illegible] cfu/day

Formular to Compare Actual Loadings to Target Values

The resultant formula for Bacteria TMDL should be used to address fecal Coliform loadings

C as cfu/100 ml * 1000 ml/1 L /0.264 gallons * Q = cfu/day

Where, C = 30-day geometric mean FC concentration
Q = event flow in million gallons/day

[1]Middle Rio Grande Total Maximum Daily Load for Fecal Coliform, NMED, 2001