

Appendix P

Training Program

This section includes the following sections:

- (1) Training Attendees
- (2) University of Arizona – SW 012217

University of Arizona

2017 Stormwater Training

Several employees of the University of Arizona received initial training on stormwater management plan (SWMP) compliance on January 23, 2017 as required by Part V.B.6.a of the Arizona Department of Environmental Quality Small MS4 Permit. A list of the attendees can be seen on the following page. The training covered the regulatory background of the plan, a general overview of the SWMP as well as how it will be implemented. Minimum Control Measures were discussed along with compliance regarding the industrial facility MSGP, construction site CGP, and Arizona Department of Environmental Quality Small MS4 General Permit.

University of Arizona 2017 Stormwater Training

Attendee List

The following employees of University of Arizona attended the U of A's 2017 Stormwater training on 1/23/2017:

Name	Employee ID
Steven J Albanese	9704129
April M Bagley	23159780
Christopher Bansil	2182319
Elizabeth R Cameron	16502888
Jeffrey G Christensen	6109833
Nicholas A Dacus	22053074
Brian F Dolan	4908403
Guillermo J Felix	12509478
Hector F Garcia	14400138
Lorna E Gray	22054967
Stephen H Husman	2400584
Larry D Jones	4700814
Therese M Lane	11208097
Randy A Livingston	9300225
Richard H Lower	5602214
Vincent J Natale	8800378
David J Ouellette	22060875
David Reiber	14609826
Timothy P Ruddy	5600481
Richard A Sandoval	17103981
Dana M Sylvester	22060687
Brek K Thompson	23210325
Herbert N Wagner Jr	2301510
Christopher J Wilt	22054742
James S Wooten	17006578
Lloyd M Wundrock	3206904
John P Zenizo	14601617
Frank Zuern, Jr.	6900096

University of Arizona

Annual Stormwater Refresher Training

The University of Arizona annual stormwater refresher training program will consist of a web-based annual refresher training in addition to a field-based training which will be developed for staff working outdoors as required by Part V.B.6.a of the Arizona Department of Environmental Quality small MS4 permit. The purpose will be to prevent pollutant runoff from campus operations due to activities such as container handling, turf and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance. Training materials will be updated annually.

Records of future trainings shall be kept on the following pages in this section.

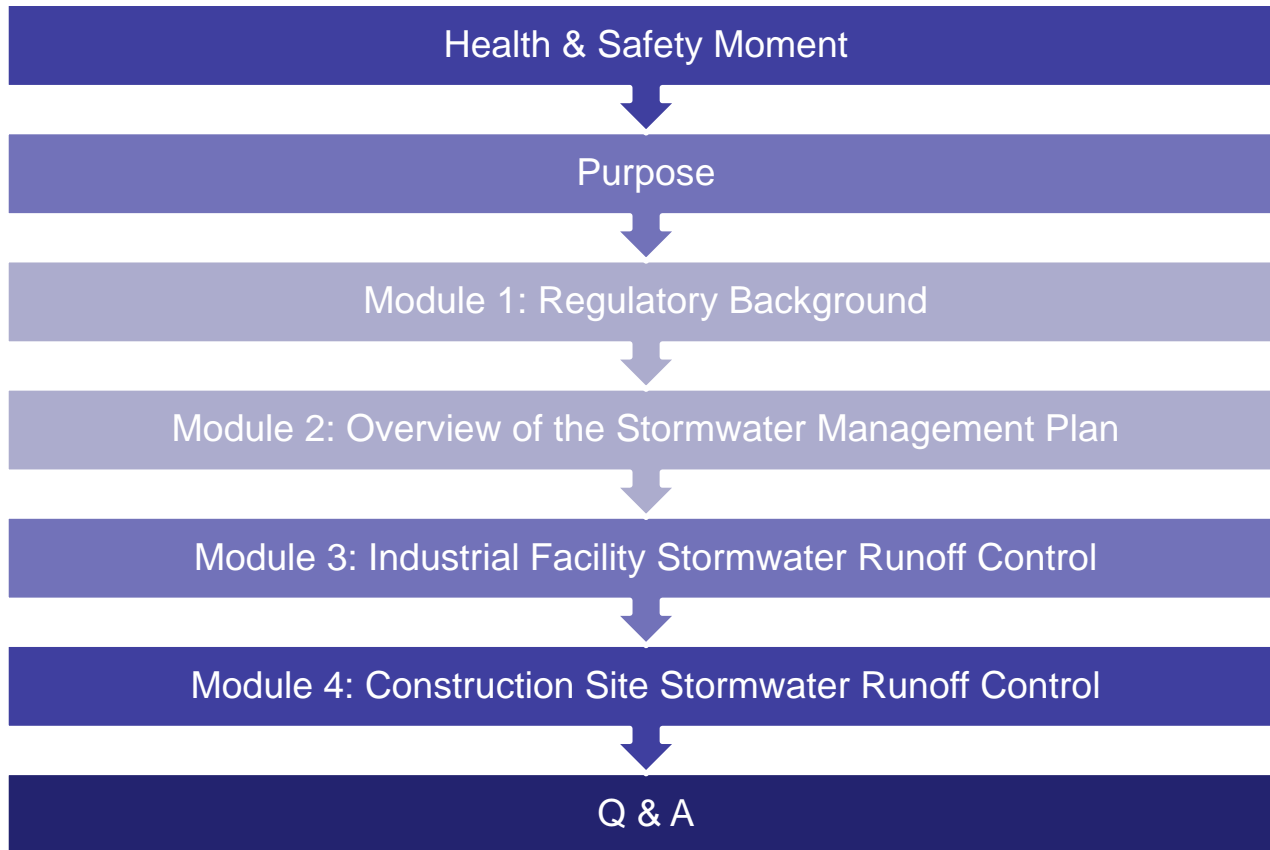
University of Arizona Stormwater



Presented by:
Glenn Hoeger & Talitha Crain






Training Agenda

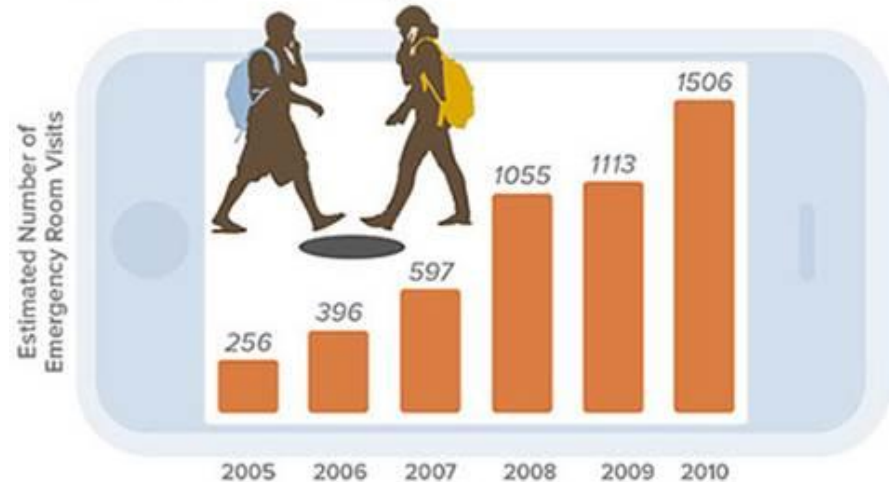


Dangers of Texting & Walking



-  91% of adults use mobile phones.
-  Pedestrian injuries that occur while using a cell phone have more than doubled from 2005 to 2010
-  Young people ages 16-25 were more likely to be injured as distracted pedestrians.

Distracted Walking



Purpose

- Provide initial stormwater *training* to address ADEQ comment on SWMP training compliance
- Training to include
 - Regulatory background
 - SWMP overview & implementation
 - Minimum Control Measures (MCMs) overview
 - Industrial facility MSGP compliance
 - Construction site CGP compliance
 - Compliance with Arizona Department of Environmental Quality (ADEQ) Small MS4 General Permit.



Module 1

Regulatory Background



Regulatory Background

- Management of stormwater runoff from urbanized areas protects our natural resources from pollutants
- Concentrated development in urbanized areas increases impervious surfaces like streets, driveways, parking lots, and sidewalks, where pollutants from human activities settle and remain until a storm event washes them into nearby storm drains often connected to a municipal separate storm sewer system (MS4)
- These MS4s discharge into local rivers and streams without treatment
- In 1972 under the Clean Water Act, Congress prohibited the discharge of any pollutant to a waters of the United States from a ***point source*** unless the discharge is allowed by a permit



Regulatory Background

- Point Source vs. Non-point Source Pollutants
 - **Point Source Pollutants:**
 - Point sources are pollutants added to waters of the United States through a discernible, confined, and discrete conveyance (section 502(14) of the Clean Water Act).
 - Example 1: sheet flow into a roadside (or in Tucson the roads themselves) storm sewer system that is then conveyed to waters of the United States
 - Example 2: runoff from urban areas into a storm sewer system that is then conveyed to waters of the United States
 - Example 3: a discharge directly from an industrial facility piped into a river

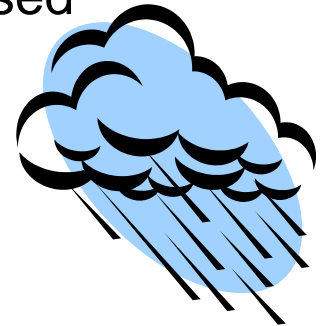


Regulatory Background

- Point Source vs. Non-point Source Pollutants (cont.)
 - **Non-point Source Pollutants:**
 - Non-point sources are generally the result of land runoff, atmospheric deposition, drainage, seepage, and come from many diffuse sources
 - Example 1: Excess fertilizer, herbicides, and insecticides from agricultural lands and residential areas
 - Example 2: Bacteria and nutrients from livestock and faulty septic systems
 - Example 3: Streambank and shoreline erosion

Regulatory Background

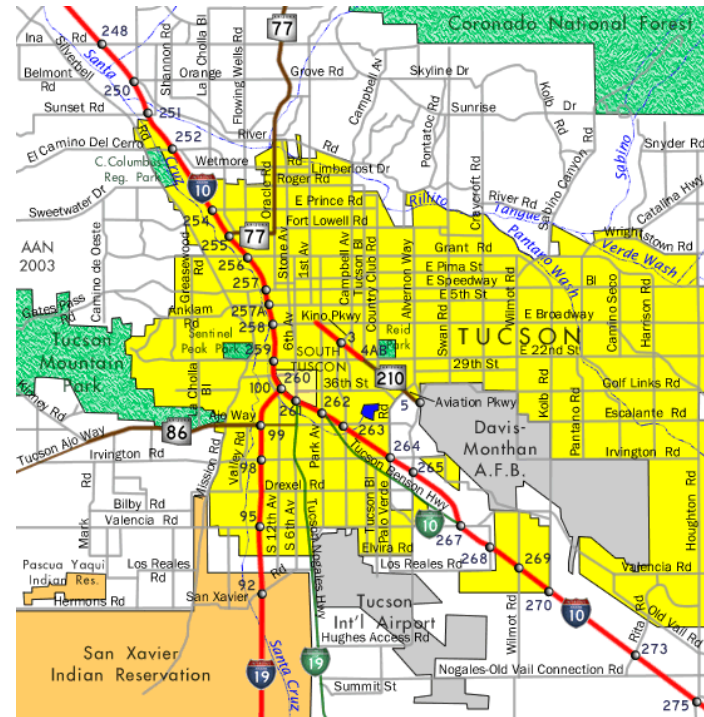
- Section 405 of the Clean Water Act of 1987 (WQA) added section 402(p) of the Clean Water Act (CWA) which required the Environmental Protection Agency (EPA) to develop a phased approach to regulate stormwater discharges.
- Phase I requirements were published November 16, 1990
- Phase II regulations were published December 8, 1999
- Phase I regulates stormwater discharges from medium and large MS4s, construction (5 acres or larger), and industrial activities
- Phase II extends the regulations to stormwater discharges from small MS4s (i.e, University of Arizona), and construction activities (1 acre or larger)



Regulatory Background

City of Tucson Established an MS4 under Phase I Rules

- City of Tucson MS4 based on City limits
- U of A lies completely within City of Tucson MS4
- U of A could choose to be regulated under City's MS4 Permit
- The City would be the enforcer of compliance under this scenario



Regulatory Background



- EPA Region 9 delegated National Pollutant Discharge Elimination System (NPDES) authority to Arizona Department of Environmental Quality (ADEQ) in 2002 (except on tribal lands)
- ADEQ is the permitting authority however, EPA Region 9 will continue to have oversight of the Arizona Pollutant Discharge Elimination System (AZPDES) program
- The definition of a small MS4 in the Phase II regulations includes storm sewers at facilities operated by the federal or state government, which includes universities
- The University of Arizona is a non-traditional small MS4 (40 CFR 122.26(b)(16)(iii) and Arizona Revised Statutes (A.R.S.) R18-9-A905)

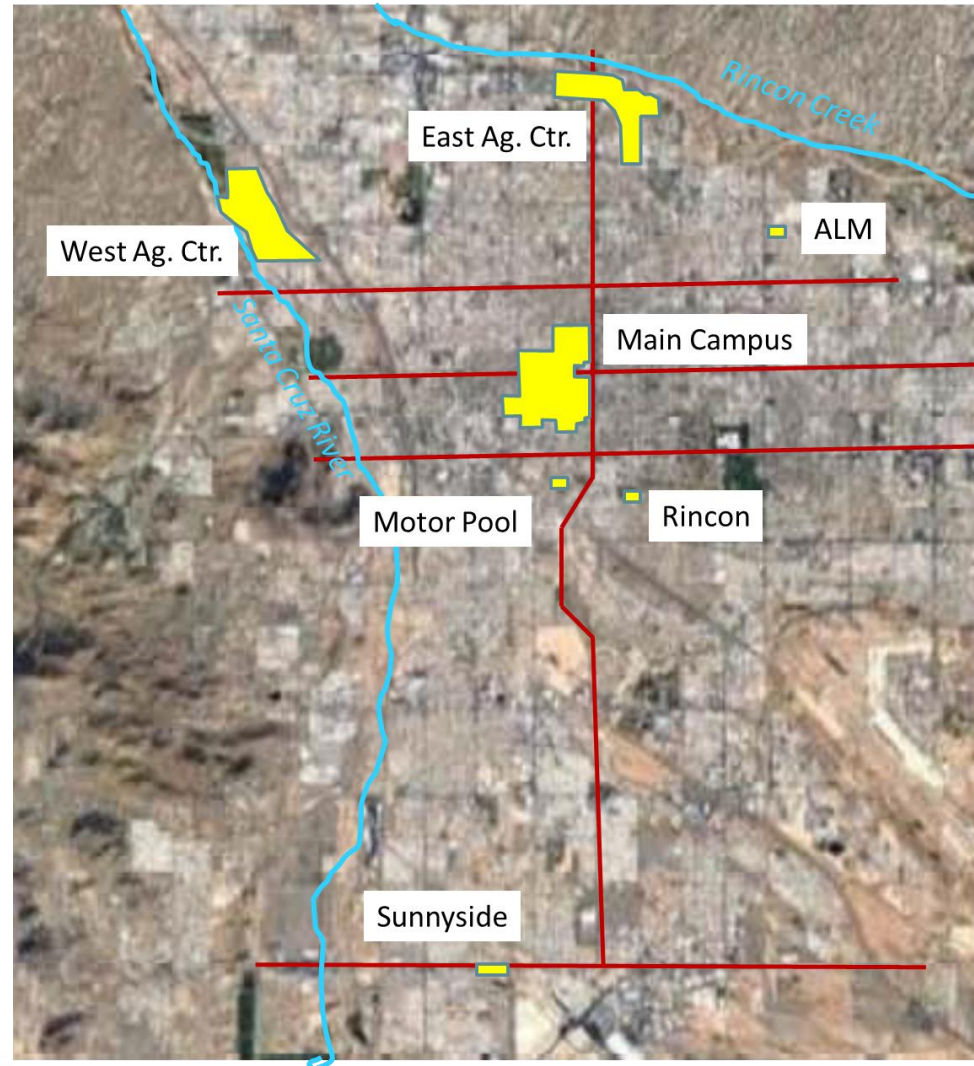
Regulatory Background

- Arizona Department of Environmental Quality (ADEQ) has prepared a Municipal Separate Storm Sewer System General Permit (Small MS4 GP)
- Permit No. AZG2016-002 (**NOI due by March 29, 2017**)
- Coverage under this permit authorizes the discharge of pollutants into municipal stormwater to waters of the United States - provided permit requirements are implemented



Regulatory Background

U of A MS4



Regulatory Background

Implications of U of A MS4 Permit:

- U of A is authorized to discharge pollutants under conditions and restrictions in the permit
- U of A is obligated to comply with the permit requirements
- U of A is the enforcer of permit requirements on all stormwater discharges within boundary of MS4



Regulatory Background

- University of Arizona (U of A) is the permittee and if they do not fulfill the permit obligations, as agreed upon by signing the Notice of Intent (NOI), this is considered a violation.
- Civil penalties are not to exceed \$25,000 per day per violation (A.R.S. § 49-262(C))
- Criminal penalties may include the possibility of fines and/or imprisonment (A.R.S. Title 49, Chapter 2, Article 3.1)



Regulatory Background



- Permit Requirements
 - Obtain permit coverage by submitting an ADEQ Notice of Intent (NOI) (Due March 29, 2017 for Permit No. AZG2016-002)
 - Establish Legal Authority to control pollutant discharges to the MS4
 - Prepare Storm Sewer System Mapping
 - Prepare and Submit a Stormwater Management Program (SWMP) with the NOI to ADEQ
 - Assess program, maintain records, and prepare annual reports documenting updates and compliance

Regulatory Background



- Permit Requirements – SWMP specific
 - The SWMP is the means through which pollutants are controlled to the maximum extent practicable (MEP)
 - ADEQ may review the NOI or SWMP materials any time and require changes (ADEQ comments to be addressed in upcoming SWMP revision)
 - SWMP must contain certain minimum required information
 - Implement SWMP within 5 years
 - If discharge ceases or the operator is changed, submit a Notice of Termination (NOT)

Regulatory Background


- Permit Requirements – SWMP specific




- The following six minimum control measures (MCMs) must be included in the SWMP submitted to ADEQ:

1. Public Education and Outreach
2. Public Involvement/Participation
3. Illicit discharge detection and elimination (IDDE)
4. Construction Site Stormwater Runoff Control
5. Post-Construction Stormwater Management in New Development and Redevelopment
6. Pollution Prevention/Good Housekeeping for Municipal Operations


Regulatory Background

- Recent U of A – ADEQ SWMP Comments 
- U of A received a letter from ADEQ on August 25, 2016 requesting implementation dates for items called out in their letter (i.e., potential non-compliance or program deficiency)
- This is an example of the ADEQ review process followed by requesting changes to the SWMP
- Revised SWMP will address ADEQ comments associated with the SWMP document, which must be implemented to maintain compliance


Regulatory Background

- Recent U of A – ADEQ SWMP Comments 
- SWMP minimum control measures to be revised to address ADEQ comments
 - MCM 3 – Illicit Discharge Detection and Elimination
 - Allowable non-stormwater discharges (i.e., swimming pools)
 - University's SWMP training program
 - Dry weather inspections
 - SOPs for illegal dumping
 - MCM 4 – Construction Site Stormwater Runoff Control
 - Formal documentation and tracking of stormwater inspections or erosion and sediment control inspections at construction sites

Regulatory Background

- Recent U of A – ADEQ SWMP Comments 
- SWMP minimum control measures to be revised to address ADEQ comments
- MCM 6 – Pollution Prevention / Good Housekeeping for Municipal Operations
 - Maintain a PP/GH specific list of facilities
 - Label all storm drains and document on the storm sewer system map

Regulatory Background

- Recent U of A – ADEQ SWMP Comments 
- SWMP minimum control measures to be revised to address ADEQ comments
- Other ADEQ comments to be addressed
 - University's SWMP training program (i.e., we are performing the initial training here)
 - Implement outdoor material storage BMP (i.e., covers and secondary containment)
 - Develop and implement a plan for conducting routine stormwater inspections
 - Develop and implement procedures for long-term stormwater inspections and maintenance schedules, including inspection and cleaning of existing BMPs

Module 2

Stormwater Management Plan

Stormwater Management Plan

Overview and Compliance Strategy

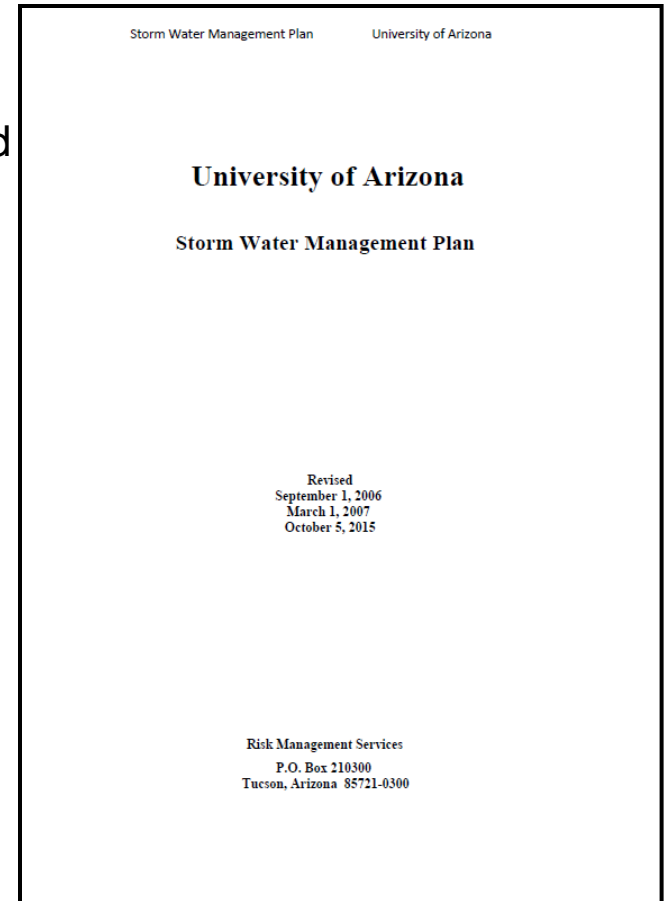


- Comply with permit requirements without having to monitor stormwater discharge at outfalls
- Provide procedures, tools, and documentation to ensure compliance



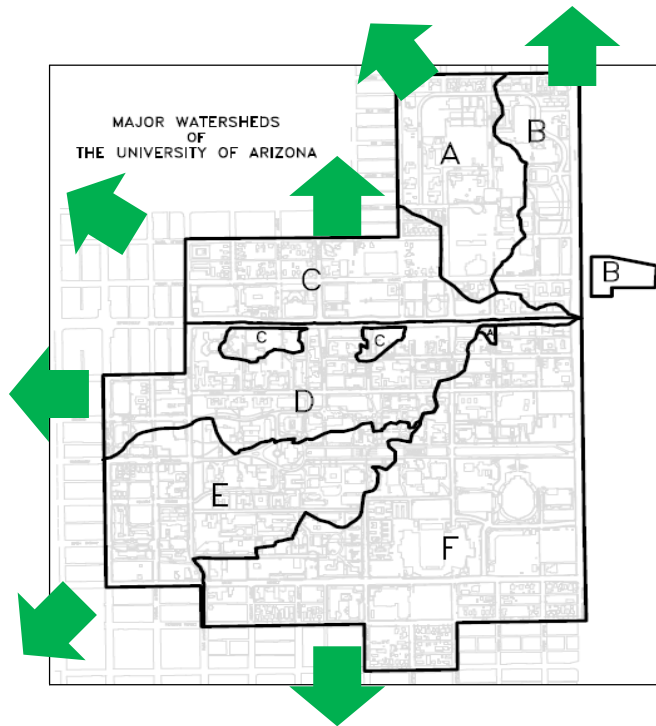
Stormwater Management Plan

1. **Introduction:** legal authority, property/land use, stormwater flow and drainage basins
2. **Pollution Prevention Team:** roles and responsibilities
3. **Drainage System:** bubblers, conveyance piping, subsurface storage and sedimentation chambers
4. **Supporting Documentation:** SWMIP and DSS
5. **Control Measures:** Minimum Control Measures (MCMs) and Best Management Practices (BMP)
6. **SWMP Review and Update**



Stormwater Management Plan

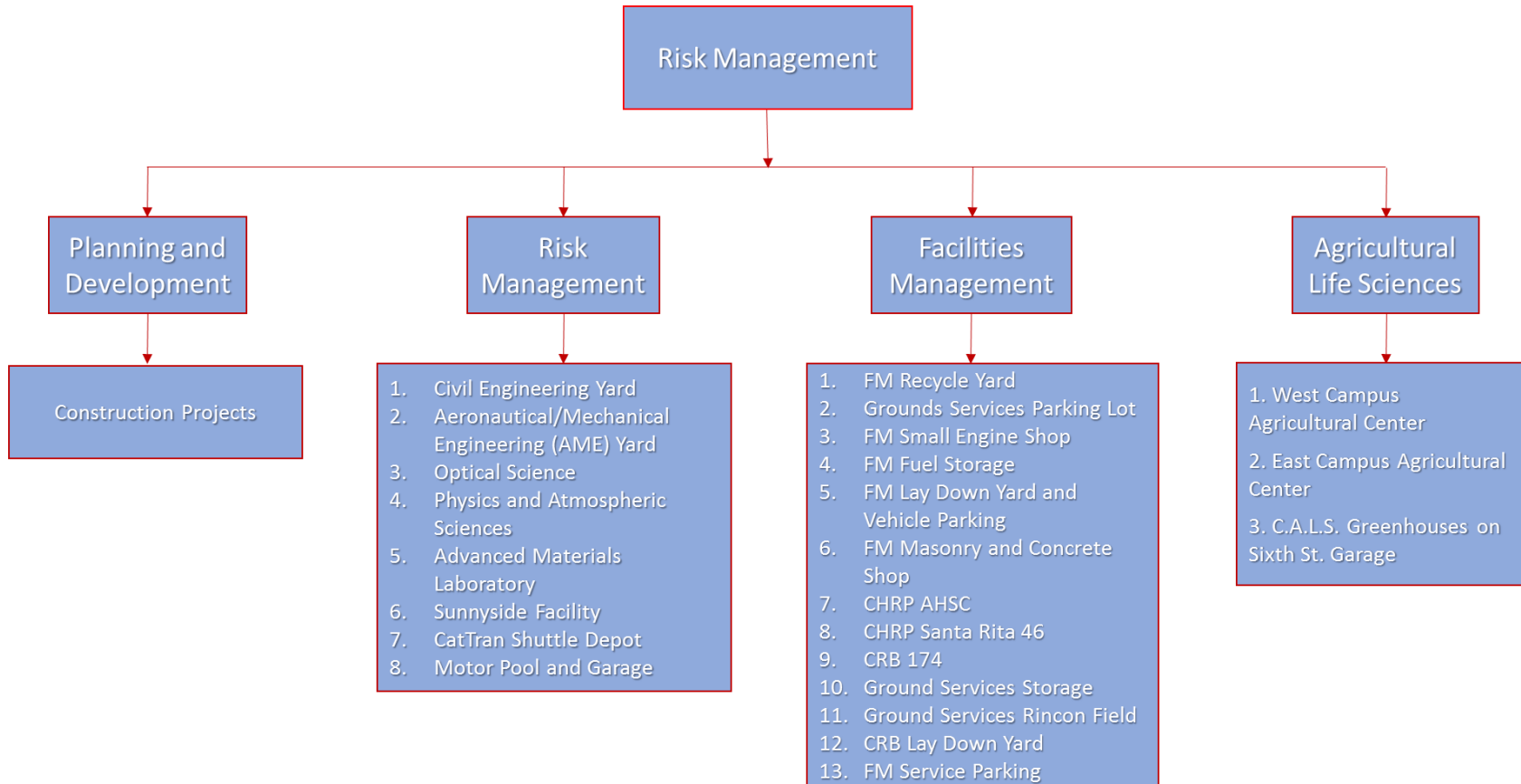
1.0 Drainage Basins and Discharge



* No Outfalls to Waters of the U.S.

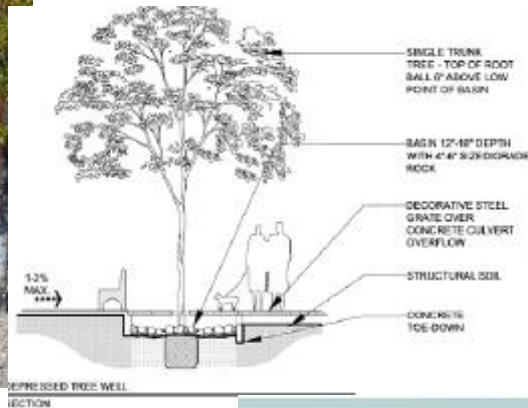
Stormwater Management Plan

2.0 - Organizational Roles and Responsibilities



Stormwater Management Plan

3.0 & 4.0 Stormwater Conveyance & Drainage Improvements



Stormwater Management Plan

5.0 Minimum Control Measures (MCM)

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination (IDDE)
4. Construction Site Stormwater Runoff Control
5. Post-construction Stormwater Management
6. Pollution Prevention and Good Housekeeping

Stormwater Management Plan

MCM #1 – Public Education and Outreach

Education and outreach made to Faculty, Staff, Students, and Visitors via web-site conveying University Policies.

Described major sources of impacts to stormwater run-off in the U of A MS4:

1. Hazardous Wastes
2. Pesticides and Fertilizers
3. Pet Waste
4. Plant Waste
5. Oil, Gasoline, Lubricants, and Other Chemicals
6. Cooling Tower Treatments
7. Vehicle and Equipment Wash Water
8. Trash
9. Swimming Pool Discharge
10. Water from External Sump Pumps

Stormwater Management Plan

MCM #1 – Public Education and Outreach - BMPs

- Website developed providing stormwater education materials brochures, fact sheets and other municipal programs
- Post information on waste sources, impacts to surface water, and proper management
- Instructions for reporting illicit discharges
- Annual review and website update

Stormwater Management Plan

MCM #1 – Public Education and Outreach – Public Services, Signage, and Brochures

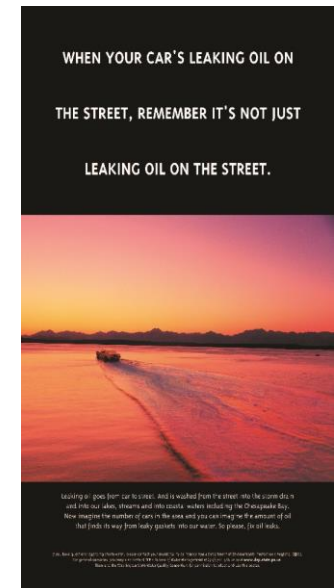
*Example: Public Service
Pet Waste Stations*



*Example: Brochure
for Student Union*



*Example: Signage
for Storm Drains*



Stormwater Management Plan

MCM #2 - Public Involvement and Participation

Community/Campus Outreach Labeling Storm Sewer Drains/Bubblers



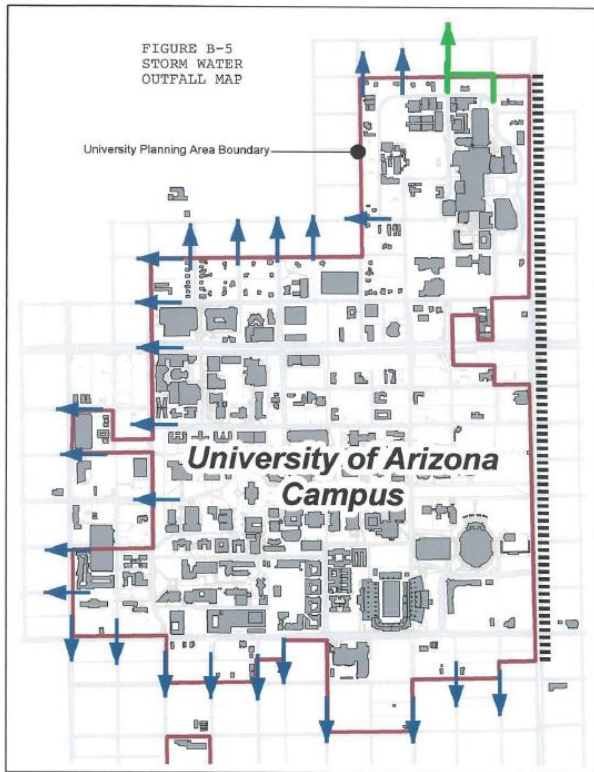
Stormwater Management Plan

MCM #3 - Illicit Discharge Detection and Elimination (IDDE)

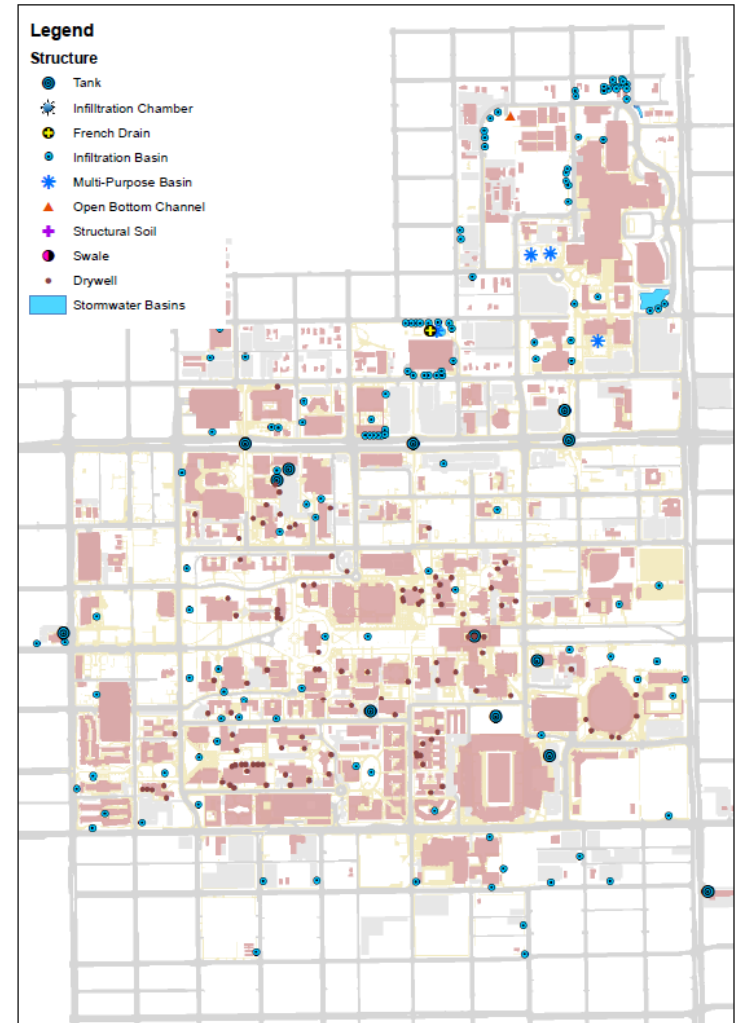
- Map of Storm Sewer System and BMPs
- Allowable Discharges
- Potential Sources of Illicit Discharges
 - Loading Docks/Sumps
 - Trash Trailers/Compactors
 - Vehicle/Equipment Wash Down
 - Spill Response
 - Pool Backwash
 - Lay Down Yards/Stockpiling
- Dry Weather Inspections

Stormwater Management Plan

MCM #3 – Storm Sewer System Mapping and BMP Mapping



Flows leaving campus via storm sewers
Flows leaving campus via street conveyance
Flows enter but do not leave campus via this edge



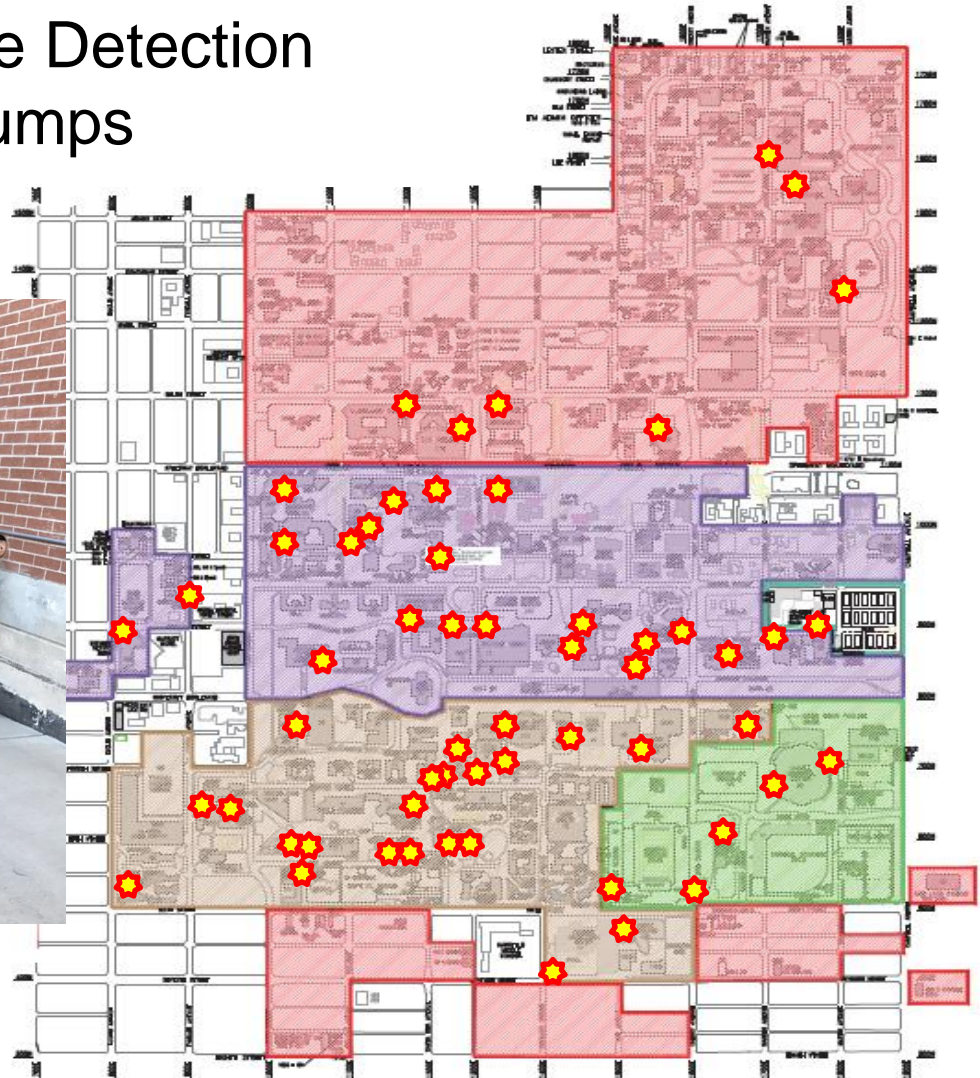
Stormwater Management Plan

MCM #3 – Allowable Discharges under Permit

- Water line flushing
- Landscape irrigation
- Uncontaminated groundwater infiltration
- Uncontaminated pumped groundwater
- Discharges from potable water sources
- Foundation drains
- Roof drainage from precipitation
- Air-conditioning/steam condensate
- Water from crawlspace/tunnel pumps
- Footing drains
- Individual residential car washing
- Dechlorinated swimming pool discharges
- Discharges from fire sprinkler system maintenance
- Sidewalk/street wash sweeping water
- Discharges or flows from emergency fire-fighting activities
- Discharges from fire pump testing
- Water/ice discharges from demonstration events

Stormwater Management Plan

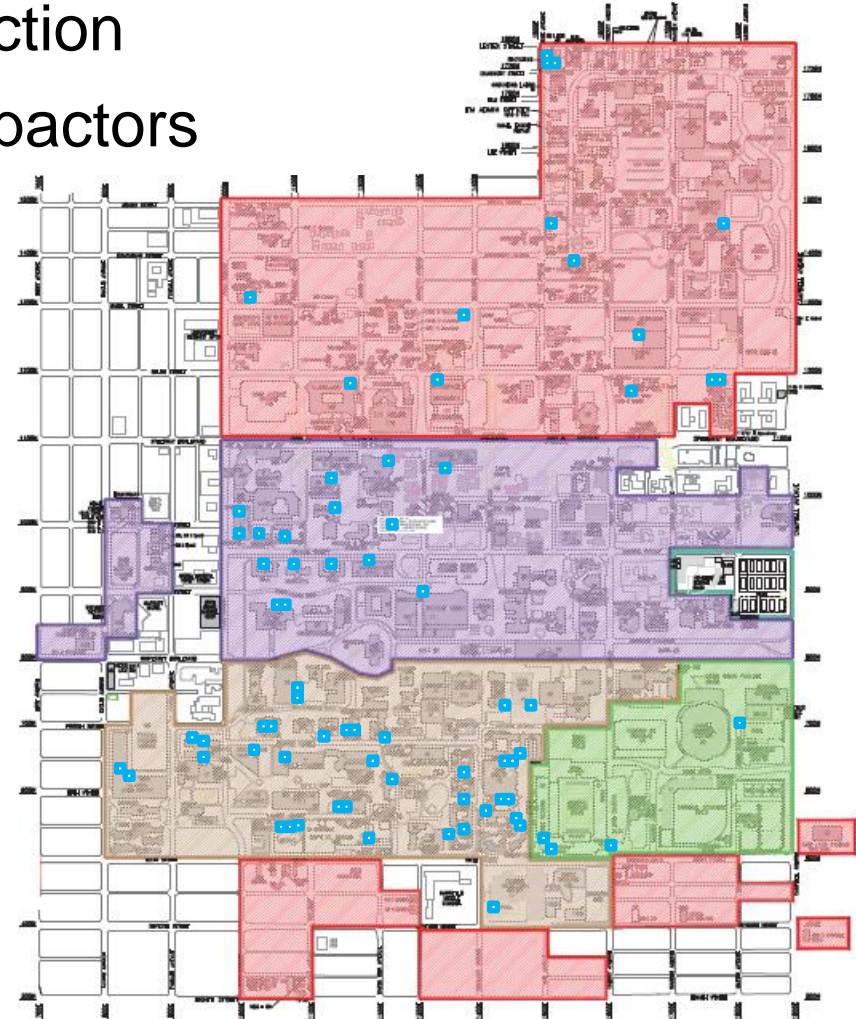
MCM #3 - Illicit Discharge Detection Loading Docks and Sumps



Stormwater Management Plan

MCM #3 - Illicit Discharge Detection

3-Yard Trash Trailers and Compactors



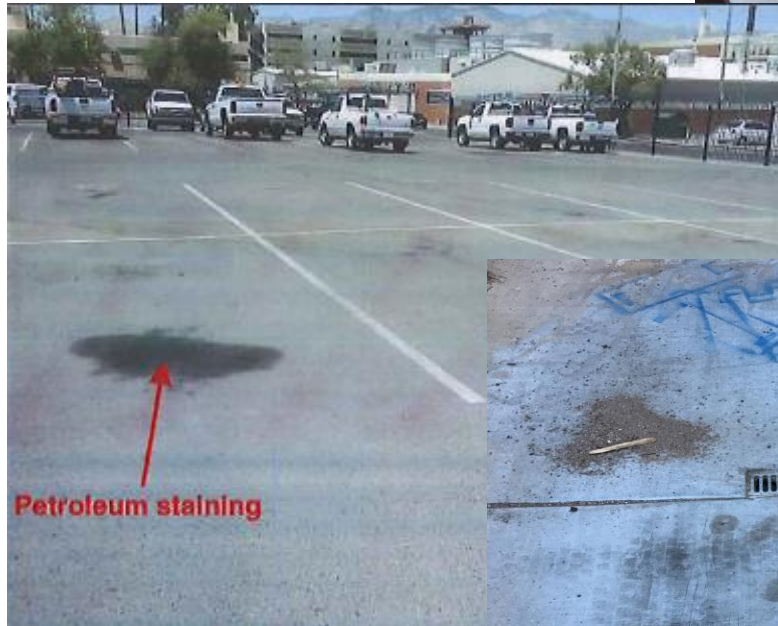
Stormwater Management Plan

MCM #3 - Illicit Discharge Detection – Washout Areas



Stormwater Management Plan

Spill Control



Stormwater Management Plan

Lay Down Yards / Stockpiling



Stormwater Management Plan

Backwash Dechlorination

The Clean Water Act requires dechlorination of all water containing more than 1 ppm of chlorine being discharged to the environment.



Dechlorination by chemical treatment...



... or by holding water in dechlorination tank

GUIDANCE MANUAL FOR THE DISPOSAL OF CHLORINATED WATER

Maria W. Tikkanen, Ph.D., East Bay Municipal Utility District, Oakland, CA
John H. Schroeter, P.E., East Bay Municipal Utility District, Oakland, CA
Lawrence Y.C. Leong, Ph.D., QEP, Kennedy/Jenks Consultants, Irvine, CA
Rajagopalan Ganesh, Ph.D., Kennedy/Jenks Consultants, Irvine, CA

This document was supplied and copied with the permission of Rajagopalan Ganesh, Ph.D for informational purposes only. We wish to thank Rajagopalan Ganesh, Ph.D for offering this copy, for distribution, of for his comprehensive work on dechlorination chemistry and it's application in treating discharge water.

Copied By:



Stormwater Management Plan

Illicit Discharge Detection



Stormwater Management Plan



Stormwater Management Plan

MCM #4 - Construction Site Stormwater Runoff Control



- Contractors are required to obtain and comply with Arizona's Construction General Stormwater Permit
- U of A is responsible to enforce compliance
- Regular progress meetings and periodic stormwater oversight inspections

Stormwater Management Plan

MCM #4 – Periodic Inspections – SWPPP Review



- Confirm SWPPP is readily accessible
- Ensure SWPPP is being updated regularly
- Confirm contractor is completing and documenting their stormwater inspections
- Confirm contractor is acting on findings of inspections



Stormwater Management Plan

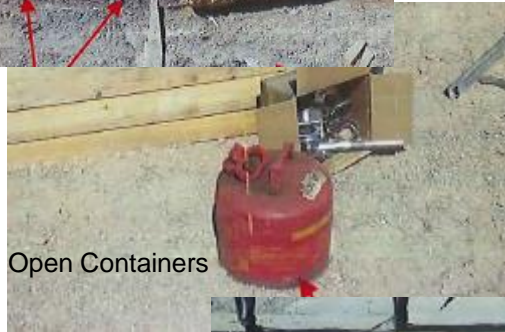
MCM #4 – Periodic Inspections – BMP Inspection



Concrete washouts



Uncontrolled sediment discharge to streets

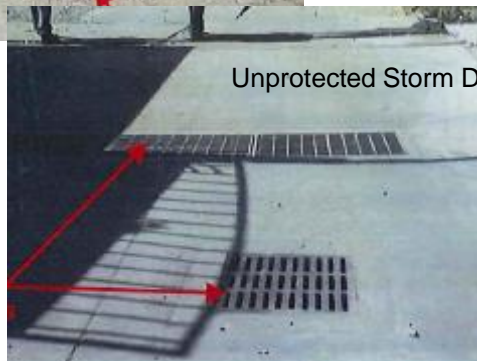


Open Containers

Tracking of sediment from vehicle tires



Track-out



Unprotected Storm Drains

Improper BMP installation



Impervious surface

Stormwater Management Plan

MCM #5 - Post Construction Stormwater Management



- Contract documents should include long-term stabilization for construction projects
- Comply with U of A design standards
- Confirm post-construction erosion controls are in place and demonstrated effective
- Maintain all post-construction BMPs with appropriate cleaning and repairs

Stormwater Management Plan

MCM #6 - Pollution Prevention and Good Housekeeping

1. Sweeping Sidewalk, Street, and Parking Garages/Lots
2. Outdoor Material Storage
3. Storm Drain Inspection and Maintenance
4. Training Program

Stormwater Management Plan

MCM #6 – Sidewalk, Street, and Parking

Conduct regular sweeping of streets, sidewalks, parking lots and parking garages.

Measurable Goals:

Conduct sweeping with the following minimum frequencies, and properly dispose of All collected solids in accordance with regulations:

Streets – weekly

Sidewalks – monthly

Parking garages – monthly

Parking lots – once per year

Facilities Management Department

Facilities Management Department

Parking & Transportation Services

Parking & Transportation Services



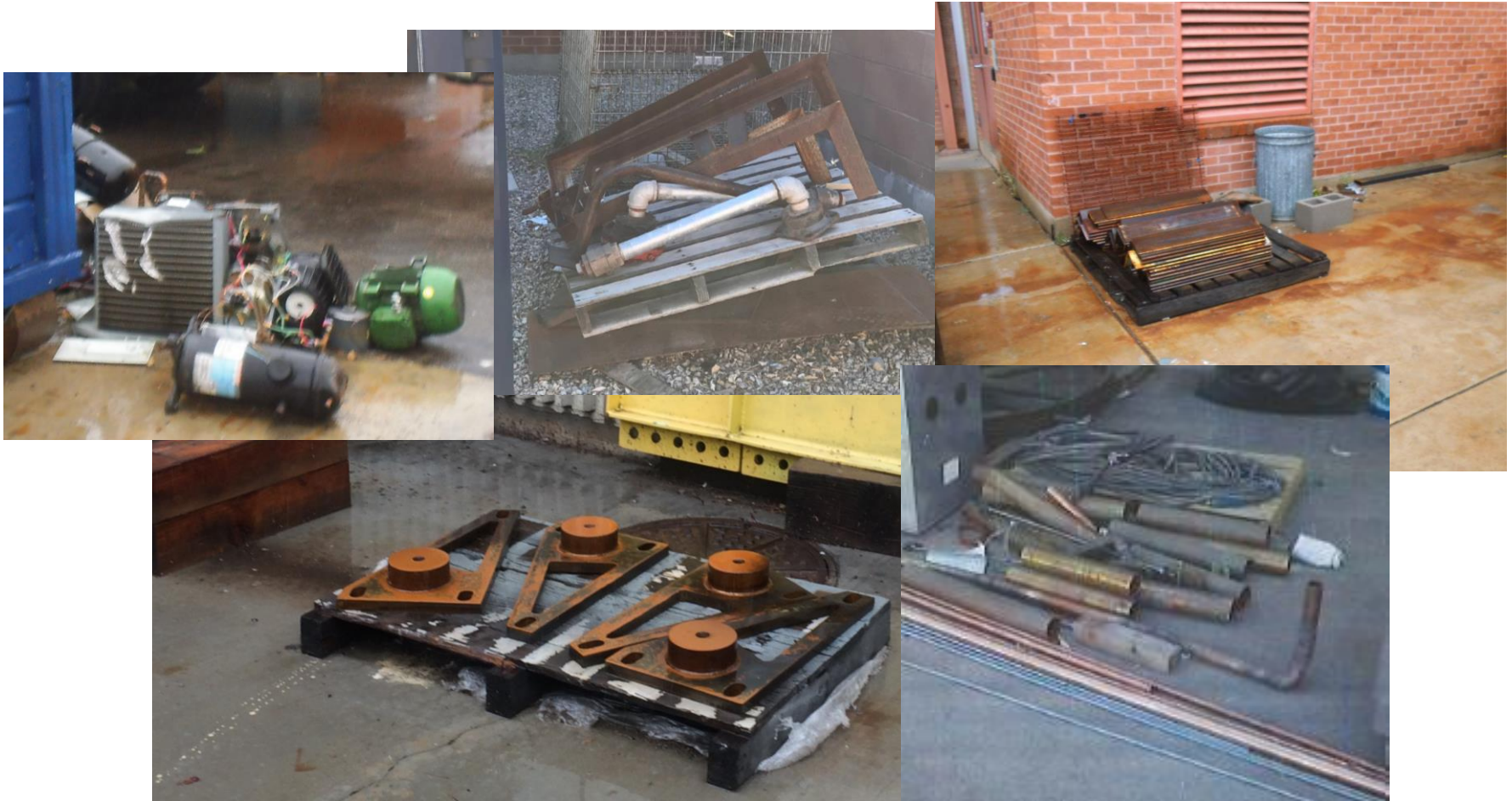
Stormwater Management Plan

MCM #6 – Outdoor Storage – Open Containers



Stormwater Management Plan

MCM #6 – Outdoor Storage – Under Cover/Tarping



Stormwater Management Plan

MCM #6 – Storm Drain Inspection and Maintenance



Stormwater Management Plan

MCM #6 – Industrial Facilities requiring SWPPP Preparation and Periodic Inspections

Risk Management

1. Physics and Atmospheric Sciences
2. Aeronautical/Mechanical Engineering (AME) Yard
3. Harshburger
4. Veterinary Science
5. Civil Engineering Yard
6. C.A.L.S (Ag. Life)
7. Mirror Laboratory
8. Softball Field
9. Optical Sciences
10. Advanced Materials Laboratory
11. Electrical Engineering Yard
12. Sunnyside Facility
13. CatTran Shuttle Depot
14. Motor Pool and Garage

Field Management

1. FM Recycle Yard
2. Grounds Services Parking Lot
3. FM Small Engine Shop
4. FM Fuel Storage
5. FM Lay Down Yard and Vehicle Parking
6. FM Masonry and Concrete Shop
7. CHRP AHSC
8. CHRP Santa Rita 46
9. CRB 174
10. Ground Services Storage
11. Ground Services Rincon Field
12. CRB Lay Down Yard
13. FM Service Parking

Agriculture Life Sciences

1. West Campus Agricultural Center
2. East Campus Agricultural Center
3. C.A.L.S. Greenhouses on Sixth St. Garage

Stormwater Management Plan

Training Program

- Compliance for Illicit Discharges
- Compliance for Storm Drain Maintenance
- Compliance for Industrial Facilities
- Compliance for Construction Sites

Module 3

MS4 and Industrial Facility Compliance

- Storm Drain Inspections and Maintenance
- Facility Stormwater Pollution Prevention

Illicit Discharge and Facility Compliance

Overview

- Dry Weather Inspections
- Storm Drain Annual Inspections and Maintenance
- Illicit Discharge Periodic Inspections and Compliance
- Industrial Stormwater Pollution Prevention Plans and Periodic Inspections
 - Facility Management Sites
 - Risk Management Sites
 - Agriculture Life Sciences Sites

Illicit Discharge and Facility Compliance

Dry Weather Inspection

- Conducted Annually
- Inspections either April 1 through June 30 or October 1 through December 30
- Flows in stormwater conveyance
- No natural seeps or groundwater discharges
- Only flows should be allowable discharges under permit



Illicit Discharge and Facility Compliance

Storm Drain Inspections and Maintenance

Annual inspection and maintenance includes:

- removal of gravel, waste, floatable trash, and debris
- removal sheen and oily residues
- removal of debris from discharge grates



Illicit Discharge and Facility Compliance

Illicit Discharge Inspections at Loading Docks

Conducted Quarterly

What to look for:

- spills, drips, and stains indicating leaks, spills or unauthorized activities
- open containers or drums
- hoses indicating illicit wash down area
- floatable trash
- spill kits



Illicit Discharge and Facility Compliance

Sump Pump Discharge



Conducted Quarterly
What to look for:

- sheen and oily residues
- foaming from detergents
- debris from discharge grates
- gravel, waste, floatable trash, and debris

Illicit Discharge and Facility Compliance

Illicit Discharge Inspection of 3-yard Waste Trailers

Conducted Quarterly

What to look for:

- covers to prevent contact of waste with stormwater
- drainage plugs
- spills, drips, and stains
- floatable trash



Illicit Discharge and Facility Compliance

Industrial Facility Stormwater Pollution Prevention Plan (SWPPP)

- SWPPPs based on the ADEQ Multi-sector General Permit (MSGP) for Stormwater Discharges from Industrial Facilities
- NOI for MSGP not required – coverage on MS4 Permit
- SWPPP includes:
 1. Standard Industrial Codes (SIC) for characterizing nature of activities at the facility
 2. BMP requirements
 3. Inspection and monitoring requirements
 4. Reporting requirements

Illicit Discharge and Facility Compliance

Industrial Facility Inspections

- Quarterly Routine Inspections / BMP Inspections (form attached)
- Semi-annual Wet Weather Visual Inspections – twice between June 1 and October 31 and twice between November 1 and May 31
- Annual Comprehensive Compliance Evaluation

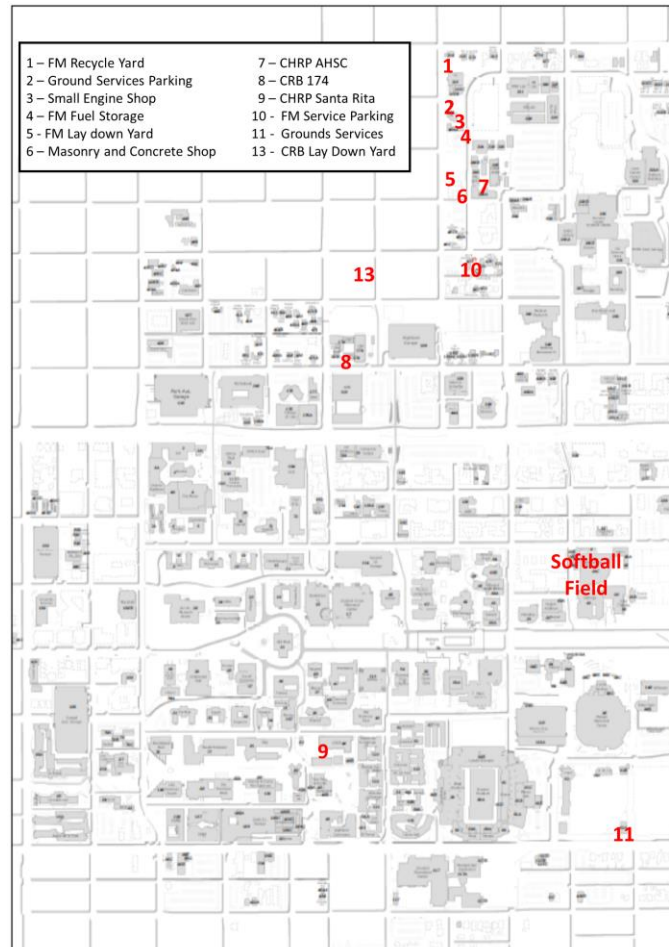
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QUARTERLY ROUTINE INDUSTRIAL FACILITY INSPECTIONS
BMP INSPECTION REPORT

Date and Time of Inspection:		Date Report Written:	
Part I. General Information			
Site Information			
Facility Name:			
Facility Address:			
Photos Taken: (Circle one)	Yes	No	Photo Reference IDs:
Weather			
Estimate storm beginning: (date and time)		Estimate storm duration: (hours)	
Estimate time since last runoff from any drainage area: (days or hours)		Rain gauge reading and location: (in)	
Description of any discharges occurring at the time of the inspection:		Description of Evidence demonstrating that previously unidentified discharges of pollutants have occurred from the site:	
Exception Documentation (explanation required if inspection could not be conducted).			
Inspector Information			
Qualified Inspector Name:		Qualified Inspector Title:	
Signature:			Date:

Illicit Discharge and Facility Compliance

Facility Management Industrial Facilities



Illicit Discharge and Facility Compliance

Facilities Management Recycle Yard – BMPs and Inspection Requirements

Inspection

- Mostly housekeeping violations
- Floatable trash
- Visible sheen
- Open trash bins and trailers
- Staining on most surfaces

Potential BMPs

- Regular asphalt cleaning
- Regular trash pickup
- Covering dumpsters
- Liquid storage cabinets



Illicit Discharge and Facility Compliance

Facilities Management Mason Yard – BMPs and Inspection Requirements

Inspection

- Concrete wash out
- Exposed raw metal materials
- Open liquid containers
- Staining on most surfaces



Potential BMPs

- Curbed concrete wash out area, vacuum wash water and dispose
- Remove metal or cover with tarp
- Remove open buckets
- Liquid storage cabinets
- Fix etched asphalt



Illicit Discharge and Facility Compliance

Facilities Management Lay Down Yard – BMPs and Inspection Requirements

Inspection

- Petroleum staining from leaking vehicles
- Exposed raw metal materials
- Material stored next to outfall

Potential BMPs

- Remove metal or cover with tarp
- Spill response and clean asphalt
- Liquid storage cabinets
- Move material storage away from stormwater discharge point



Illicit Discharge and Facility Compliance

Facilities Management Small Engine Shop – BMPs and Inspection Requirements



Inspection

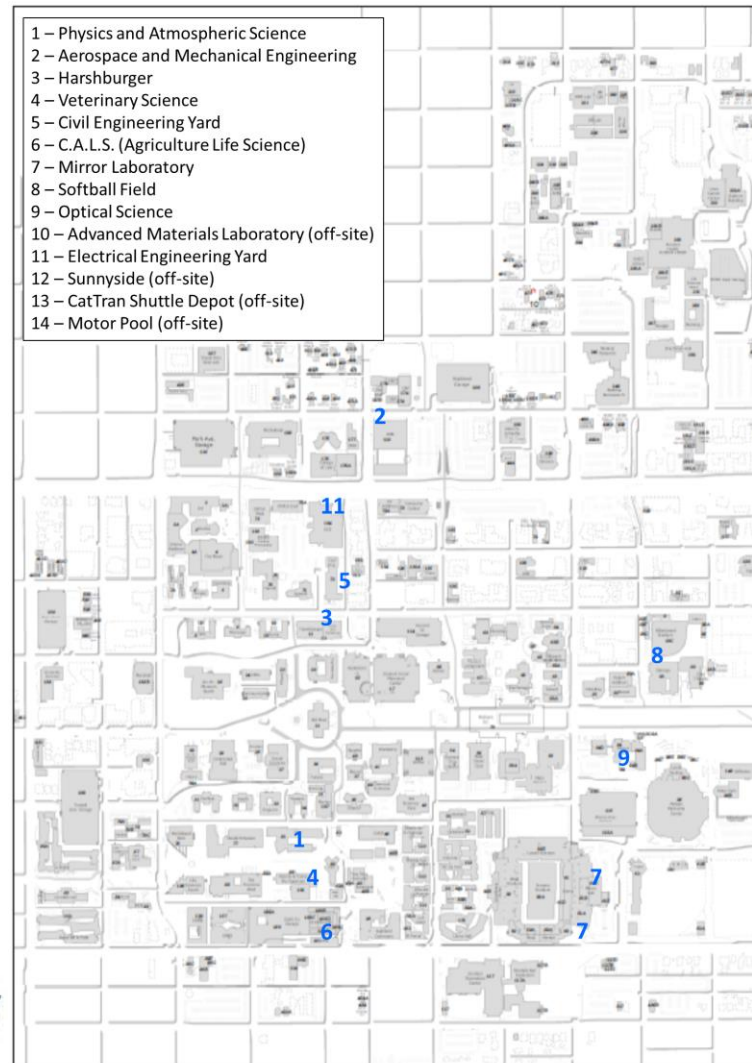
- Mostly housekeeping
- Open trash container outdoors
- Visible staining from illicit washing
- Open floatable trash

Potential BMPs

- Contain wash water
- Concrete cleaning
- Regular trash pickup
- Move trash containers indoors

Illicit Discharge and Facility Compliance

Risk Management Industrial Facilities



Illicit Discharge and Facility Compliance

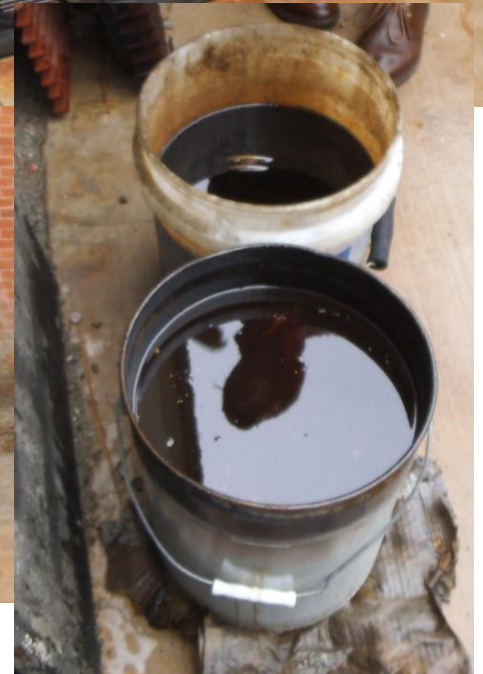
Risk Management Civil Engineering Yard – BMPs and Inspection Requirements

Inspection

- Concrete wash out
- Exposed raw metal materials
- Open liquid containers
- Staining on most surfaces

Potential BMPs

- Curbed concrete wash out area, vacuum wash water and dispose
- Remove metal or cover with tarp
- Remove open buckets
- Liquid storage cabinets
- Fix etched asphalt



Illicit Discharge and Facility Compliance

Risk Management Aerospace and Mechanical Engineering – BMPs and Inspection Requirements



Inspection

- Mostly housekeeping
- Open liquid containers
- Visible staining from illicit washing
- Exposed raw metal

Potential BMPs

- Remove containers
- Wash concrete
- Remove metal or tarp/cover

Illicit Discharge and Facility Compliance

Risk Management Softball Field – BMPs and Inspection Requirements

Inspection

- Off-site entrainment of red clay surface

Potential BMPs

- Extend concrete curb to divert stormwater flow off field
- Silt fence or equivalent along the fence line
- Increase sweeping to weekly or more during rain seasons



Module 4

Construction Stormwater Runoff Control

Construction Site Stormwater Runoff Control

- University of Arizona General Description
 - Located in Tucson, Arizona
 - U of A's Main campus is approximately 393 acres and includes the Arizona Health Sciences Center (AHSC)
 - The Banner Medical Center is privately owned and operated and is not a part of the U of A MS4 program
 - Stormwater drainage flows primarily via surface drainage ways to City of Tucson streets
 - There are also storm water sewer systems, retention, and detention basins serving sections of campus

Construction Site Stormwater Runoff Control

- Adherence to the small **MS4 permit** requirements associated with construction:
 - Develop, implement and enforce a program to address construction activity with land disturbance greater than 1 acre
 - Use a regulatory mechanism to require construction site operators to practice erosion and sediment control and require construction site operators to control waste and properly dispose of wastes
 - Review all site plans for potential water quality impacts
 - ***Develop and implement procedures for site inspection and enforcement of control (our focus based on comments from ADEQ)***
 - Include specific information in the SWMP

Construction Site Stormwater Runoff Control

- Operator(s) must adhere to ADEQ's General Permit for Stormwater Discharges Associated with construction activity (CGP) (Permit No. AZG2013-001) associated with construction
 - Also referred to as the **Arizona Construction General Stormwater Permit (CGP)**
- Operator(s) must adhere to **University of Arizona Manual of Design and Specification Standards (DSS)**
- If construction disturbs more than **one acre** of soil, per CGP and DSS, adherence to and permit coverage under the CGP is required

Construction Site Stormwater Runoff Control

- CGP Definition of an “Operator” – 3 options
 - 1 - Owner acts as sole operator
 - Property owner conducts design work, develops and implements SWPPP, and serves as general contractor
 - 2 – Contractor acts as sole operator (U of A approach)
 - Owner hires a construction company to design the project, prepare the SWPPP, and supervise implementation (i.e., a “turnkey” project)
 - 3 – Owner and contractor both act as operators
 - Owner retains control over any changes to site plans, SWPPP, or stormwater control designs
 - The contractor is responsible for overseeing actual earth disturbing activities and daily implementation of SWPPP and other permit conditions

Construction Site Stormwater Runoff Control

- ADEQ comment on MCM-4 Construction Stormwater
 - Although construction inspections have been ongoing by U of A to provide oversight to contractors (i.e., the “Operator” on record), ADEQ requested that the U of A perform formally documented and tracked stormwater inspections or erosion & sediment control (E&SC) inspections at construction sites located on U of A property
 - U of A responded confirming they will establish a program for construction site E&SC inspections and will clearly identify the procedures within the SWMP, and document the inspections performed

Construction Site Stormwater Runoff Control

- Construction Stormwater inspections – “Operator”
 - Construction stormwater inspection form that an “Operator” (i.e., U of A contractor), who must comply with the Construction General Stormwater permit (CGP), should use during construction inspections.
 - ADEQ has this CGP Inspection & Corrective Action Report form available online at:
 - http://legacy.azdeq.gov/environ/water/permits/download/cgp_inspection_form2013.pdf
 - If the Operator does not use the ADEQ form, content must at a minimum match the ADEQ information required

Construction Site Stormwater Runoff Control

- Construction Stormwater inspections – MS4 Oversight of “Operator”
 - Inspection forms associated with the MS4 (i.e., U of A) oversight of the “Operator” (i.e., U of A contractor), per the small MS4 permit, may be tailored to provide more of an oversight focus
 - Inspection frequency for “Oversight” inspection (i.e., U of A conducting oversight of the contractor) shall be quarterly at a minimum

Construction Site Stormwater Runoff Control

- Construction Stormwater inspections – MS4 Oversight of “Operator”
 - See handout for details related to the construction “Oversight” inspections to be conducted by U of A
 - MS4 (U of A) inspection forms address oversight of “Operator”:
 - Evaluation of “Operator” implementation of CGP requirements and onsite BMPs
 - Evaluation of “Operator” inspection program
 - Is the “Operator” conducting inspections at the CGP required frequency?
 - If a deficiency is noted on the inspection form, how long does it take for them to address or “close-out” the issue? Is it within the permit required timeframe?
 - Evaluation of “Operator” recordkeeping practices and/or SWPPP updates

Construction Site Stormwater Runoff Control

- Construction Stormwater inspections - “Operator”
 - The type of information that will need to be gathered by the “Operator”
 - Operator/Operator(s) listed on the Notice of Intent (NOI)
 - Name of Project, Tracking Number, Inspection Date
 - Name, title, and contact information of the inspector
 - Inspector signature
 - Phase of construction (e.g., rough grading, utility and road installation, vertical construction, final landscaping and site stabilization)
 - Inspection schedule
 - Whether the inspection was triggered by a predicted storm event (e.g., 0.5”, 24-hour storm predicted)
 - Non-stormwater discharge information (e.g., fire hydrant leak, etc.)
 - Notation of unsafe conditions if applicable (e.g., conditions, location where the conditions were encountered)

Construction Site Stormwater Runoff Control

- Construction Stormwater inspections - “Operator” (cont.)
 - The type of information that will need to be gathered by the “Operator”
 - Inspection of discharge points and comments regarding discharge characteristics (e.g., color, odor, clarify, etc.) and recommended corrective actions
 - Notation of any visible signs of erosion or sediment accumulation at discharge points and recommended corrective actions
 - Description of Control Measures (Erosion and Sediment Control, Stabilization, or Pollution Prevention Control Measures) and notes (e.g., provide details about needed additional control measures, maintenance performed, etc.)
 - Whether additional controls are needed
 - Whether repairs or maintenance on existing controls are needed
 - Recordkeeping

Construction Site Stormwater Runoff Control

- Construction Stormwater inspections – “Operator” (cont.)
 - The type of information that will need to be gathered by the “Operator”
 - If a corrective action is needed
 - Operator must adhere to CGP required corrective action timelines (Part 5 of the CGP)
 - Identify the date/time the problem was first discovered
 - Identify the site conditions, and
 - Provide a description of the problem along with the estimated date of completion
 - If the estimated date of completion falls after 7-day deadline, then
 - Explain the reason it is infeasible to complete work within 7 days
 - Provide the schedule for installing in the soonest practicable timeframe
 - Provide the Actual completion date and note if a SWPPP Update is necessary
 - If a SWPPP update is necessary, specify the date the SWPPP was modified

Construction Site Stormwater Runoff Control

- Construction Stormwater inspections - “Operator”
 - Inspection frequency as required in the CGP for projects exceeding one acre of land disturbance
 - Once every 7 calendar days (or)
 - Once every 14 calendar days and within 24 hours of each storm event sized at 0.5” or greater in 24 hours (or)
 - The site will be inspected a minimum of once per month, but not within 14 calendar days of the previous inspection and within 24 hours of the occurrence of a storm event of 0.25 inch or greater.

Construction Site Stormwater Runoff Control

- Construction Stormwater inspections - “Operator”
 - Inspection frequency as required in the CGP for projects exceeding one acre of land disturbance
 - A reduced inspection schedule (once per month) is allowed if the entire site has been temporarily stabilized, discharges are unlikely based on seasonal rainfall patterns, or runoff is unlikely due to winter conditions (e.g., site is covered with ice)
 - Projects less than one acre are not subject to CGP requirements -
*unless the activity is part of a larger common plan of development or sale that would disturb one-acre – similar to housing developments that will sell individual residential homes

Construction Site Stormwater Runoff Control

- Construction Stormwater inspections - “Operator”
 - When opting for the once every 14 calendar days inspection frequency, for instance, the “Operator” must also conduct inspections within 24 hours of the occurrence of a storm event sized at 0.5” or greater in 24 hours.
 - How to predict a 0.5”, 24-hour storm will occur or to check post-storm data to determine if a 0.5”, 24-hour storm event occurred

Weather Data

- Weather tracking example
 - <http://www.noaa.gov/>
 - Get weather forecast for “85721” or “Tucson, Arizona”
 - Click “Forecast Weather Table Interface” under “Additional Forecasts and Information” for forecasted information
 - From this page, for post-storm information
 - Click “Climate” Tab, select “Local” => “Observed Weather”
 - Click “Daily Climate Report” for “Tucson” after every rain event
 - *Save as PDFs or Scan and file printouts*
- MS4 (i.e., U of A) oversight may include review of records to verify weather data recordkeeping occurs to support an inspection frequency of once every 14 days, should the “Operator” opt for this frequency option

Weather Data

Home News Organization FAQ Share | f t+ e Search WR NWS ALL NOAA Go

Get Local Forecast For:
 Enter location go
 Search Help

f t+ YouTube
 XML RSS Feeds

Current Hazards
 Watches / Warnings
 Outlooks
 NOAA Watch
 Severe Weather
 Observations
 Radar
 Satellite
 Precipitation
 Upper Air Data
 Webcams & Road Reports

Forecasts
 Forecast Discussion
 Local Area
 Activity Planner
 Aviation Weather
 Fire Weather
 Severe Weather
 Hurricane Center
 Models
 Evapotranspiration

Hydrology
 Rivers and Lakes
 Local Hydrology
 Climate
 Local
 National
 Drought
 More...
 Climate portal
 Weather Safety
 Preparedness
 Weather Radio
 SkyWarn™
 StormReady
 Safety Brochures

Additional Info
 Items of Interest
 Other Useful Links
 Education Resources

No Warnings or Advisories In Effect for this Point.
 For warnings and/or advisories in effect for adjacent areas to this point,
 see <http://www.wrh.noaa.gov/hnx>

**Forecast For Lat/Lon: 35.0340/-118.2580 (Elev. 3195 ft)
 5 Miles W Mojave CA**
 Forecast Created at: 8pm PDT Jul 28, 2013
 Custom Weather Forecast Table

	Sun Jul 28				Mon Jul 29				Tue Jul 30				Wed Jul 31				Thu Aug 01				Fri Aug 02							
Weather																												
Daily-Temp	High 92 Low 72				High 93 Low 70				High 91 Low 69				High 93 Low 69				High 93 Low 70				High 94 Low 69							
Chance of Precip	5%	10%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Precip	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"	0.00"												
12-hr Snow Total	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"												
FRET	0.36"				0.38"				0.39"				0.42"				0.43"				0.39"							
6-Hour Temp	5am	11am	5pm	11pm	5am	11am	5pm	11pm	5am	11am	5pm	11pm	5am	11am	5pm	11pm	5am	11am	5pm	11pm	5am	11am	5pm	11pm	5am	11am	5pm	11pm
Temp	73	88	88	76	70	87	90	76	69	87	88	76	69	87	91	77	70	88	91	77	69	89	92	77	69	89	92	77
Cloudiness	0%	24%	24%	2%	0%	2%	2%	0%	0%	9%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Dewpoint	49	50	47	47	45	43	40	42	41	40	39	40	39	39	35	35	34	32	32	31	29	31	32	33	31	31	32	33
Relative Humidity	40%	24%	26%	37%	42%	20%	18%	29%	36%	17%	18%	27%	32%	16%	15%	22%	26%	13%	13%	18%	21%	12%	12%	19%	22%	22%	22%	22%
Wind	NW	SW	W	NW	NW	SW	SW	NW	NW	SW	SW	NW	NW	SW	W	W	W	W	W	W	W	W	W	W	W	W	W	W
Snow Level (ft)	14619	14600	14600	14637	14637	14709	14709	14907	14907	15210	15210	15643	15643	15728	15728	15761	15761	15839	15839	15841	15841	15841	15654	15654	15654	15654	15654	15654

Forecast Weather Table Interface

Select Weather Format

Custom Weather Table Point Forecast Matrix
 XML Hourly Tabular Forecast
 Point Forecast Page Hourly Weather Graph

Interval in Hours: 1 3 6

Duration in Days: 1 2 3 4 5 6 7

Enter a Location or Click on Map Below

Search by address; city,state; latitude/longitude...

Weather Data

These data are preliminary and have not undergone final quality control by the NCDC - <http://www.ncdc.noaa.gov>.

Climatological Report (Daily)

000
CDUS46 KHNX 281126
CLIBFL

CLIMATE REPORT
NATIONAL WEATHER SERVICE SAN JOAQUIN VALLEY, CA
426 AM PDT SUN JUL 28 2013

.....
...THE BAKERSFIELD CLIMATE SUMMARY FOR JULY 27 2013...
CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 1889 TO 2013

WEATHER ITEM	OBSERVED TIME VALUE	(LST)	RECORD VALUE	YEAR	NORMAL VALUE	DEPARTURE FROM NORMAL
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.....
TEMPERATURE (F)

YESTERDAY						
MAXIMUM	102	437 PM	117	1933	98	4
				1908		
MINIMUM	77	510 AM	52	1914	71	6
AVERAGE	90				85	5

PRECIPITATION (IN)

YESTERDAY	0.00		T	1969	0.00	0.00
				1964		
MONTH TO DATE	T				0.00	0.00
SINCE JUL 1	T				0.00	0.00
SINCE JAN 1	2.36				4.39	-2.03

SNOWFALL (IN)

YESTERDAY	0.0
MONTH TO DATE	0.0
SINCE JUN 1	0.0
SINCE JUL 1	0.0
SNOW DEPTH	0

Best Management Practices BMPs

- Use tools (e.g., BMP Handbooks, U of A DSS requirements) to determine if BMPs are installed properly
- Example handbook with BMP fact sheet details: Arizona Department of Transportation (AZDOT)
 - <http://azdot.gov/docs/default-source/water-quality/2012-epcm-complete.pdf?sfvrsn=2>
- See handouts for example fact sheets and an example “operator” inspection form

Best Management Practices BMPs

- Construction Site Planning & Management BMPs
 - CP-1 Construction Sequencing
 - CP-2 BMP Inspection and Maintenance
- Erosion Control BMPs
 - EC-1 Preserve Vegetation
 - EC-2 Minibenches/Slope Roughening
 - EC-3 Mulch Cover
 - EC-4 Seeding
 - EC-5 Geotextiles/Erosion Control Blankets
 - EC-6 Soil Binders
 - EC-7 Crown Ditch



Best Management Practices BMPs

- Runoff Control BMPs
 - RC-1 Earth Dikes/Drainage Swales and Lined Ditches
 - RC-2 Cut to Fill Slope Transitions
 - RC-3 Erosion Protection at Structures
 - RC-4 Rock Outlet Protection/Velocity Dissipation Devices
 - RC-5 Slope Drains
 - RC-6 Check Dams

Best Management Practices BMPs

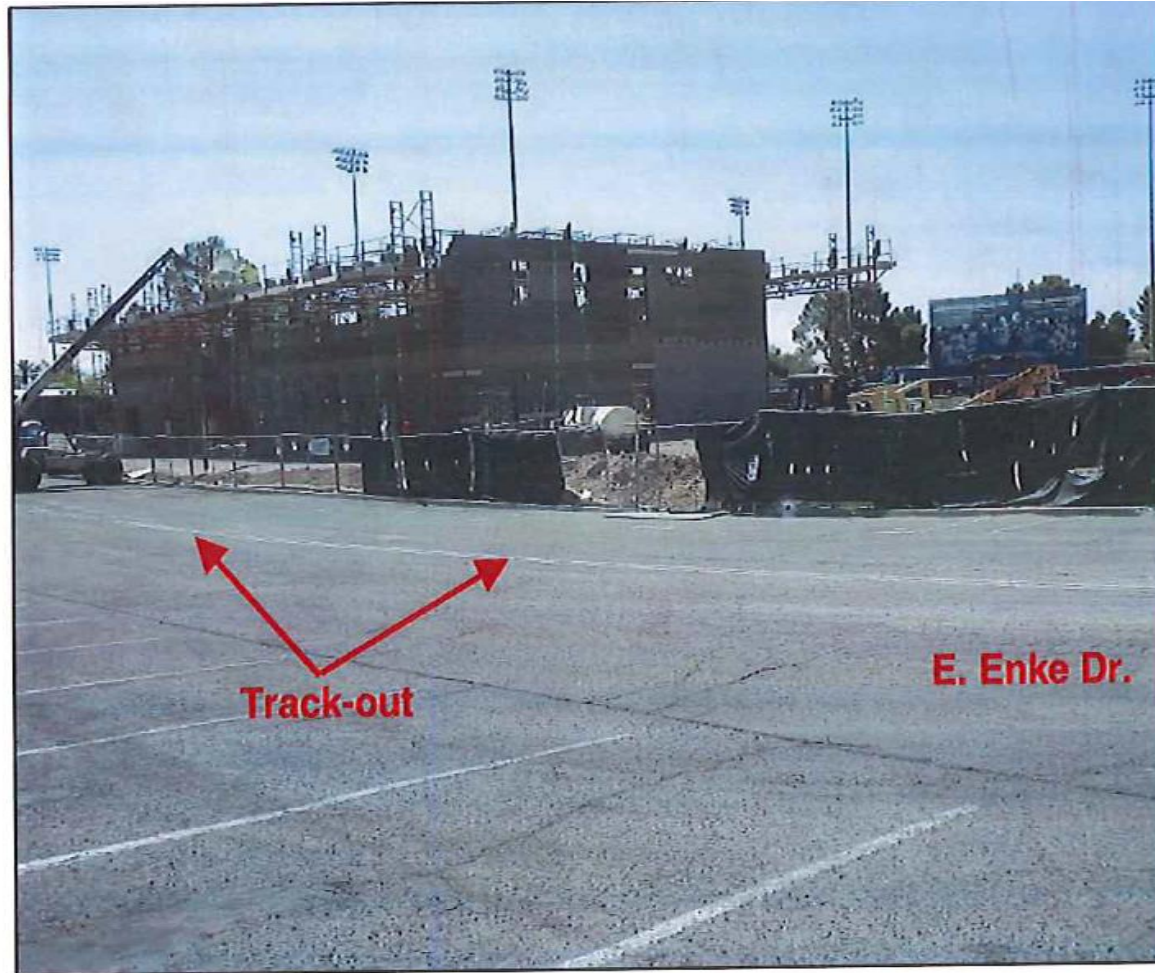
- Sediment Control BMPs
 - SC-1 Sediment Control Berm
 - SC-2 Silt Fence
 - SC-3 Sediment Trap
 - SC-4 Sediment Basin
 - SC-5 Sediment Wattle
 - SC-6 Sediment Log
 - SC-7 Gravel Bag Barrier
 - SC-8 Storm Drain Inlet Protection
 - SC-9 Curb Inlet Protection
 - SC-10 Stabilized Construction Entrance/Exit
 - SC-11 Stabilized Construction Roadway
 - SC-12 Compost Sock
 - SC-13 Rock Berm



Best Management Practices BMPs

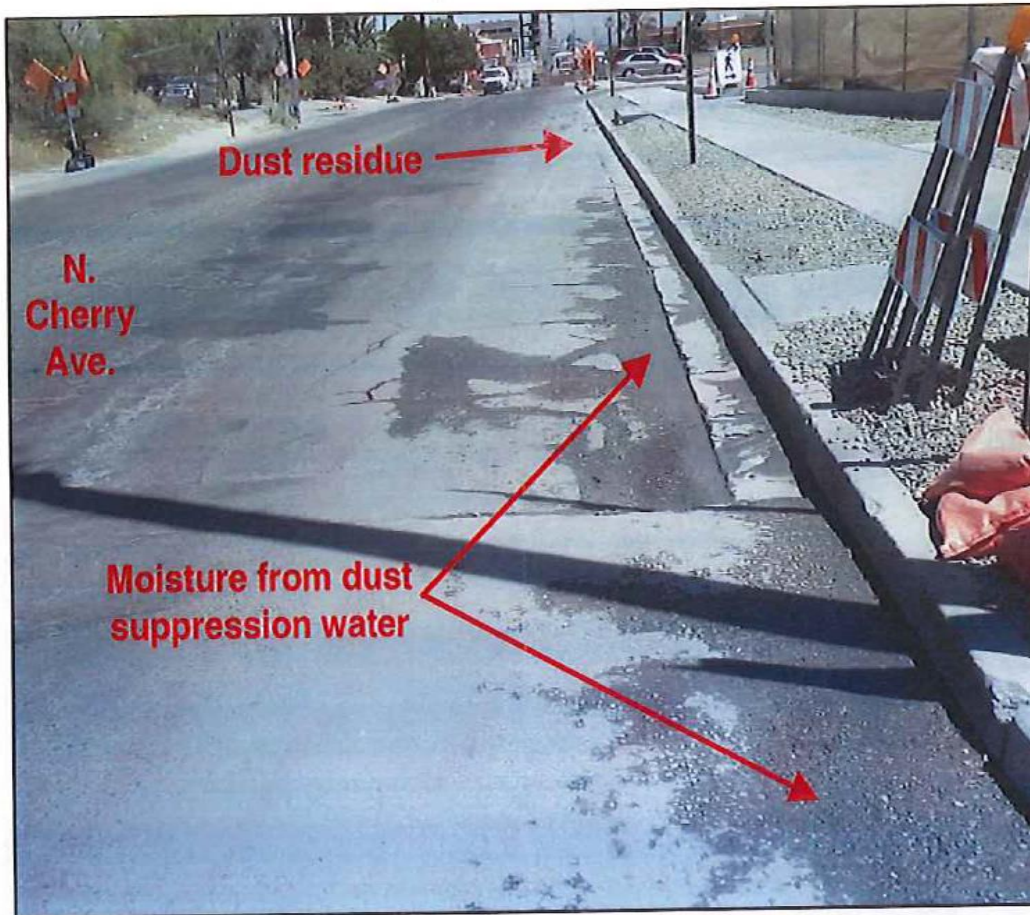
- Good Housekeeping BMPs
 - GH-1 Vehicle and Equipment Cleaning
 - GH-2 Vehicle and Equipment Fueling
 - GH-3 Vehicle and Equipment Maintenance
 - GH-4 Street Sweeping and Vacuuming
 - GH-5 Material Delivery and Storage
 - GH-6 Material Use
 - GH-7 Stockpile Management
 - GH-8 Spill Prevention and Control
 - GH-9 Portable Toilet

Construction BMP Audit Photos



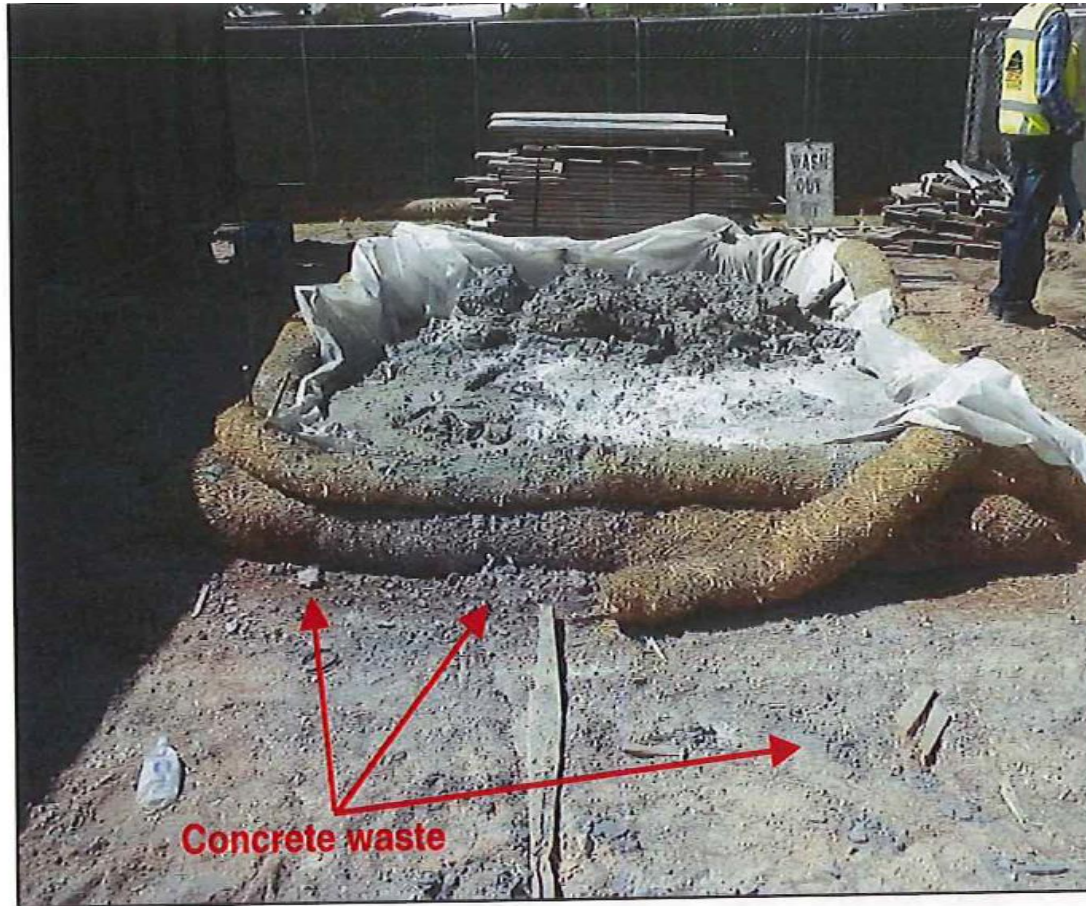
Photograph 3. View, facing southeast, of the C.A.T.S Academic Center construction site. Minor sediment track-out was observed on East Enke Drive, which runs along the northern border of the site and staging area.

Construction BMP Audit Photos



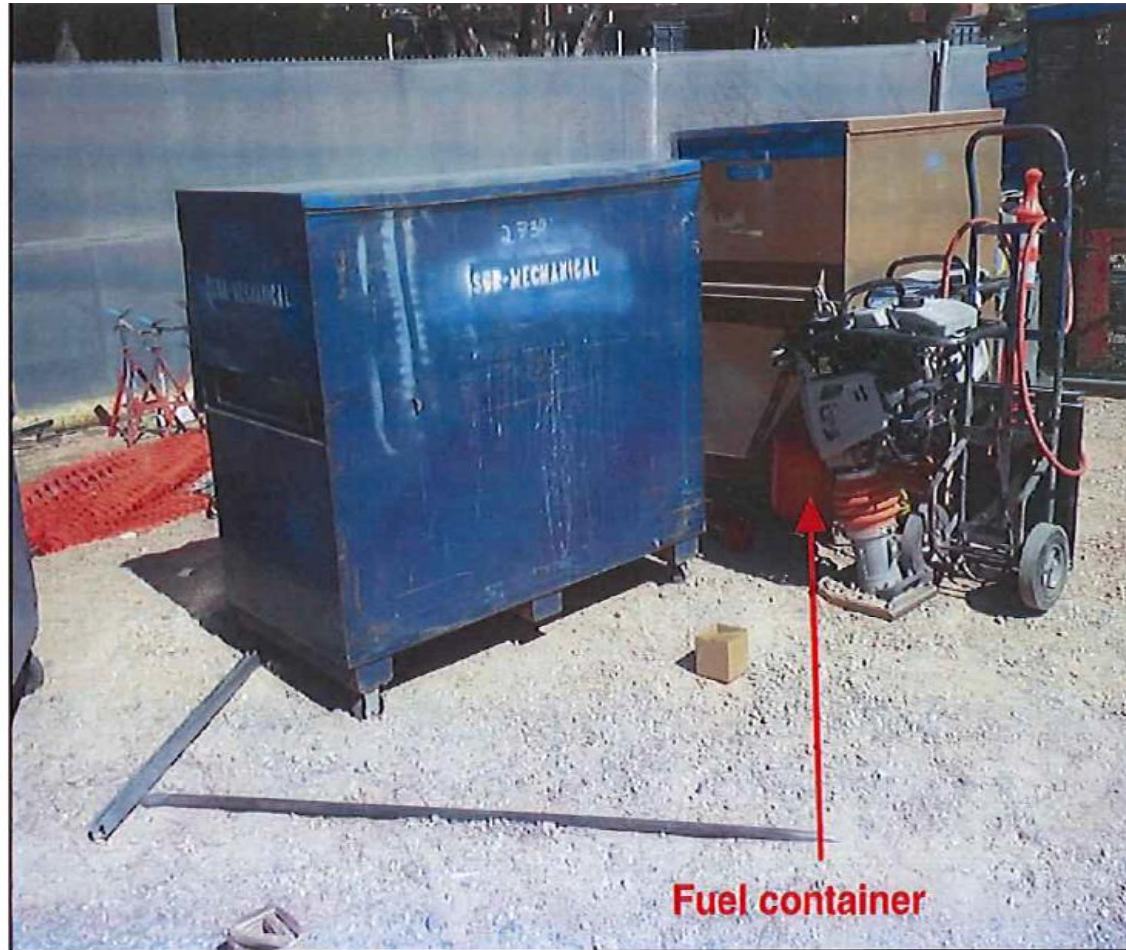
Photograph 22. View, facing north, of moisture on the pavement at the intersection of East Mabel Street and North Cherry Avenue. The Project Superintendent explained that the moisture was from water applied on the streets around the site to reduce dust. Dust residue was observed along the curb and gutter line of North Cherry Avenue, north of the site. It appeared to the Audit Team that dust suppression water was mobilizing sediment down North Cherry Avenue.

Construction BMP Audit Photos



Photograph 13. View, facing south, of a concrete washout structure in the southwest corner of the staging area. The washout was constructed of straw wattle BMPs and plastic tarping. Concrete waste was observed on the ground around the washout.

Construction BMP Audit Photos



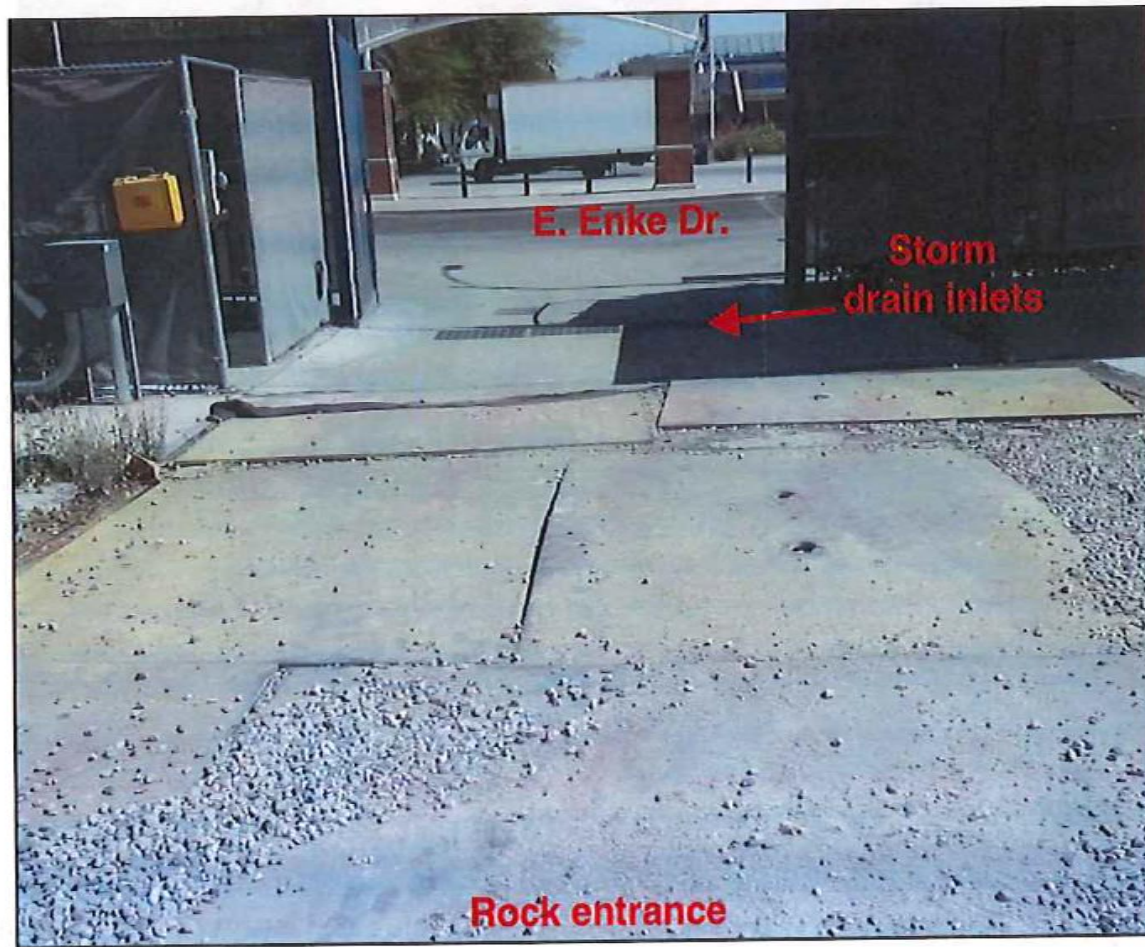
Photograph 16. View of an uncontained, uncovered fuel container stored on the west side of the staging area. The site Project Manager stated that the container most likely had been left out overnight by a subcontractor because it was chained to a piece of construction equipment.

Construction BMP Audit Photos



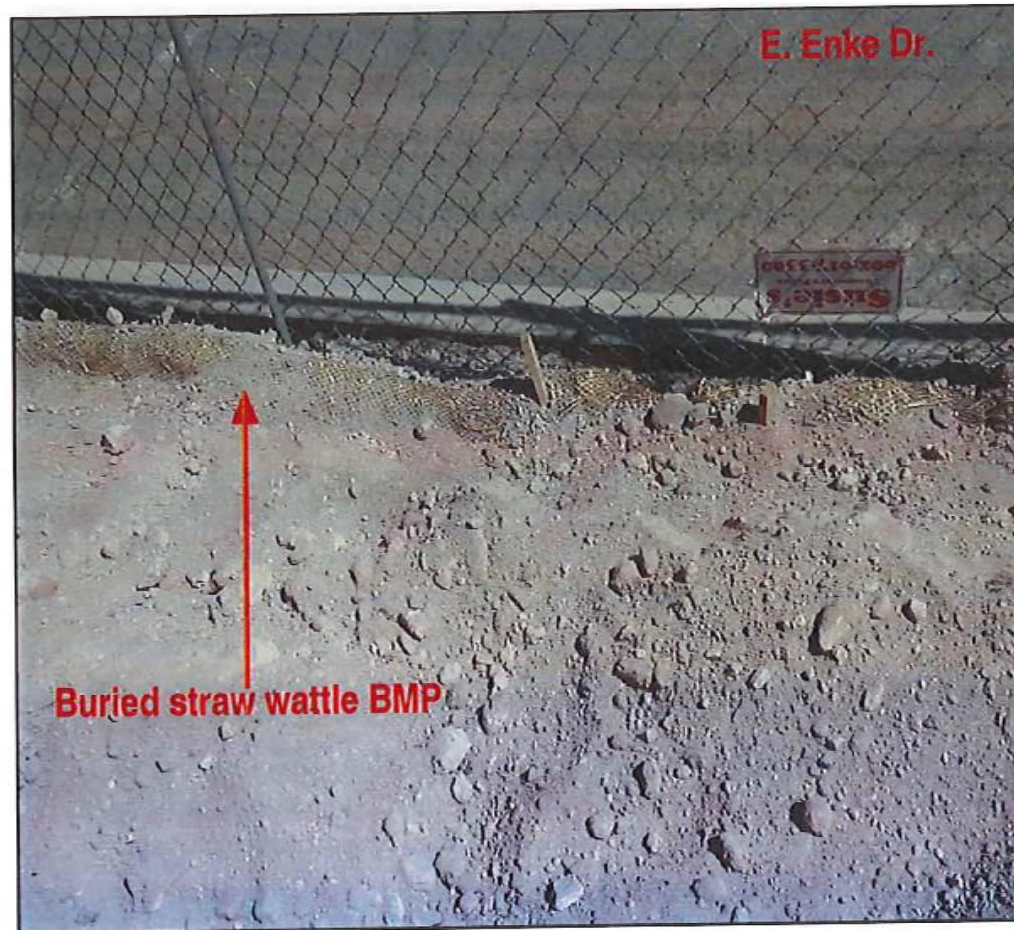
Photograph 50. View of the facility's northwest corner. Staining was observed on the impervious surface. In addition, an uncovered dumpster was located in this portion of the facility.

Construction BMP Audit Photos



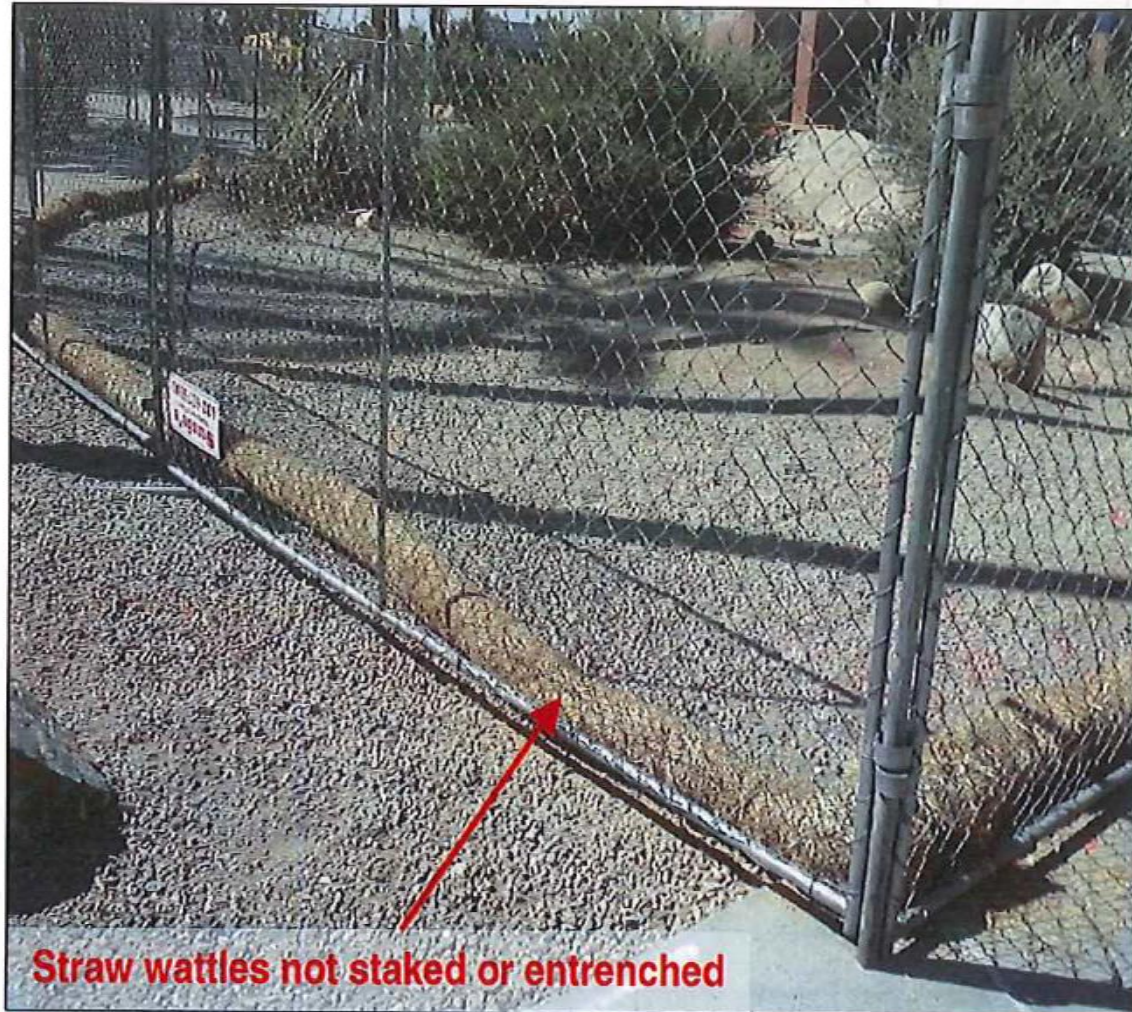
Photograph 4. View, facing north, of the rock-lined construction entrance installed at the staging area immediately east of the construction area. Two unlabeled, unprotected storm drains were observed at the entrance to the staging area.

Construction BMP Audit Photos



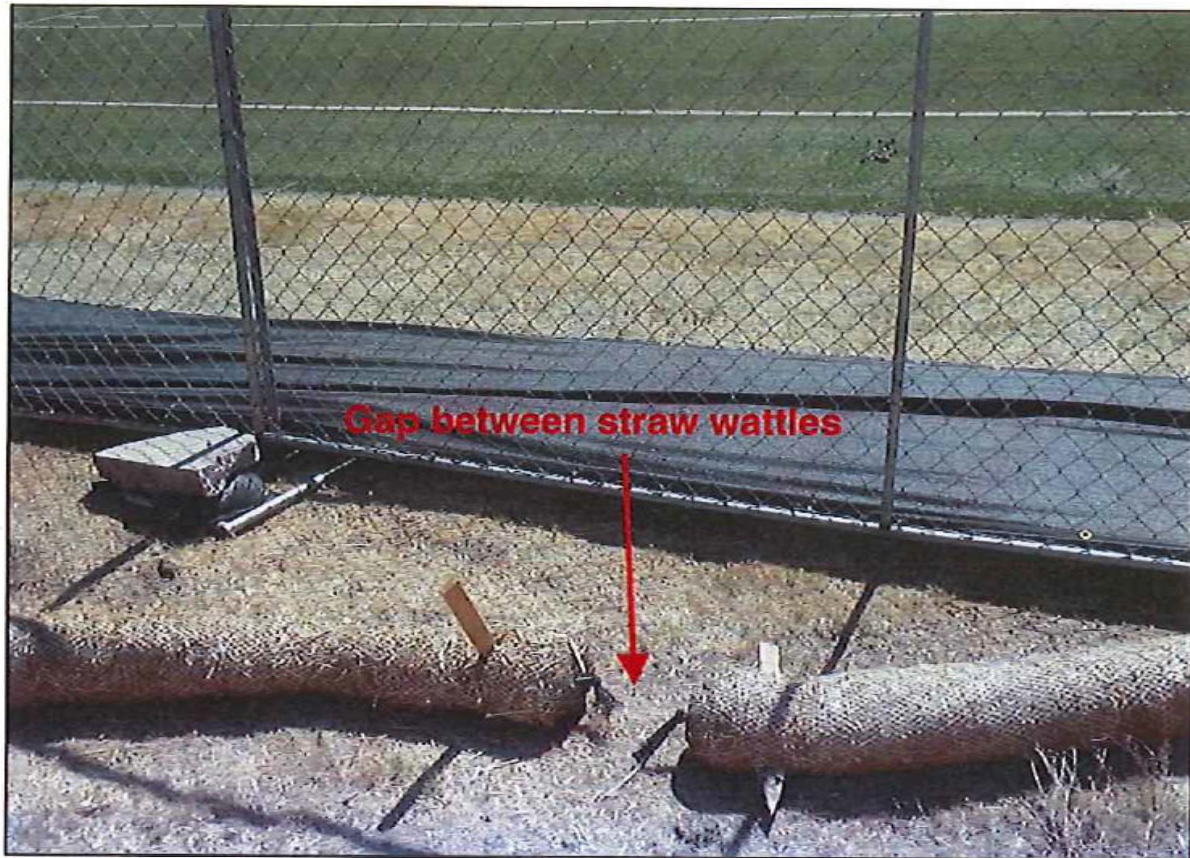
Photograph 8. View of straw wattle BMPs installed along the northern border of the site; the wattles were buried in sediment.

Construction BMP Audit Photos



Photograph 9. View of incorrectly installed straw wattle BMPs at the site. The wattles were not staked down or entrenched in the ground at the time of the site visit.

Construction BMP Audit Photos



Photograph 10. View of a gap between two sections of straw wattle BMPs installed along the eastern border of the staging area. The wattles were not staked down or entrenched in the ground.

Construction BMP Audit Photos



Photograph 11. View of straw wattle BMPs installed immediately upgradient of a stormwater discharge point in the southwest corner of the staging area. The straw wattles were staked down; however, they were not entrenched in the ground.

Record Keeping

- Documentation

- BMP deficiencies / Corrective actions
- Changes in site conditions
- Analytical monitoring results (or rationale demonstrating stormwater monitoring is not necessary)
- Inspection Reports
- Corrective Action Reports
- Final stabilization

- Annual Report

- Applies only to construction sites that discharge directly to or within $\frac{1}{4}$ mile of an impaired water

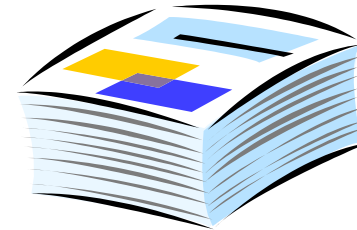
- Notice of Termination

- “Operator” to send via certified mail within 30 days after the new owner or operator assumes responsibility for the facility



Record Keeping

- ADEQ CGP records must be retained for at least 3 years from the date that permit coverage expires or is terminated, and information must be available at the site
 - Inspection reports, field notes, photos, etc.
 - Monitoring records including field measurements, weather forecasts, etc.
 - Calibration records of field instruments
 - Inspection exemption records
 - SWPPP amendments
 - Deficiency correction timelines
- A hardcopy of the SWPPP must be onsite at all times
- SWPPP is a “living document”



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