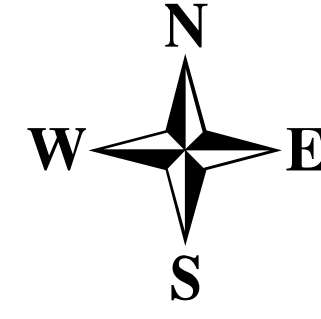


City of Patterson General Plan

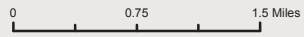
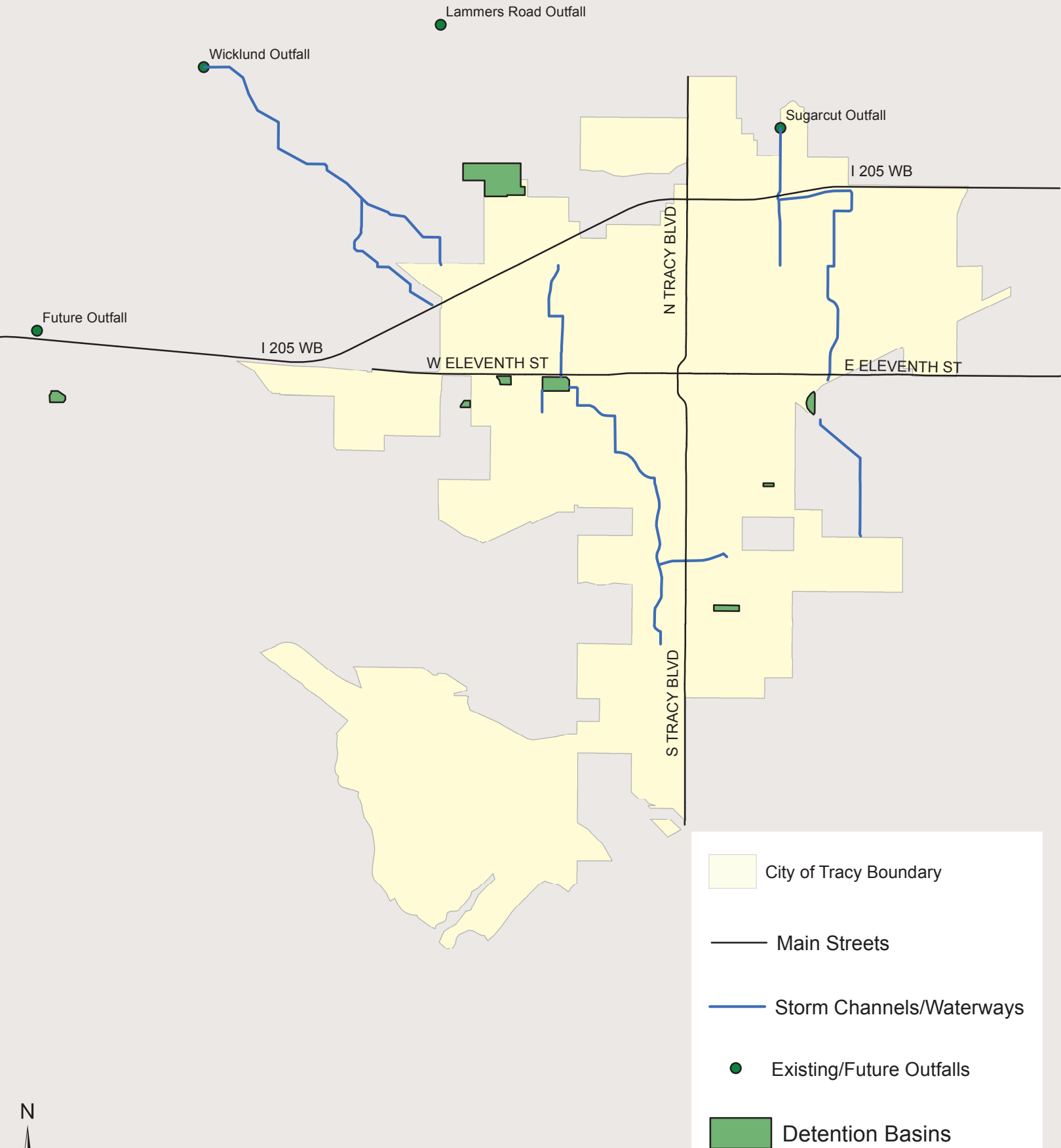
Legend

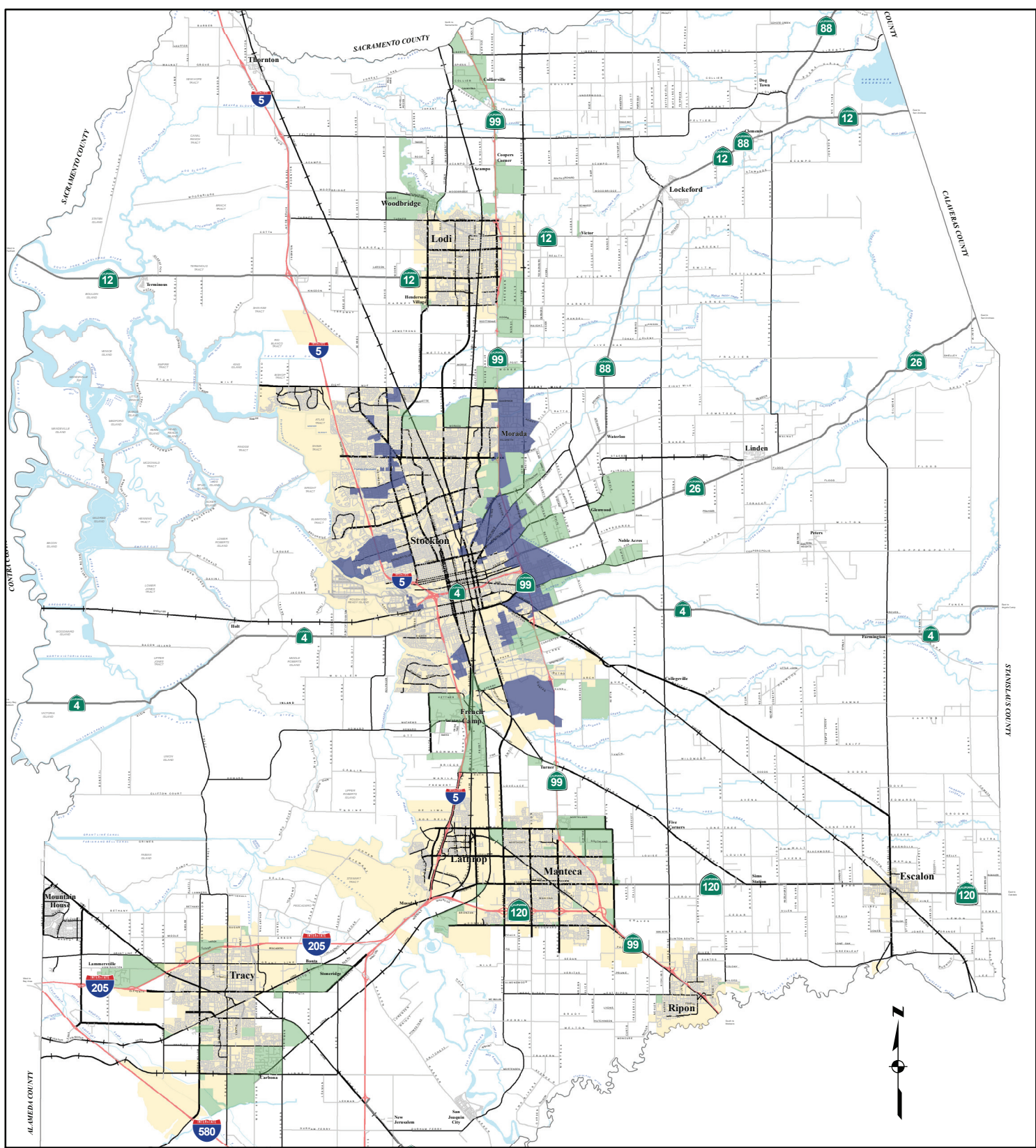
- City Limits
- Sphere of Influence
- Agriculture Transition Areas
- Estate Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Downtown Residential
- Highway Service Commercial
- Downtown Core
- General Commercial
- Mixed Use
- Medical Professional
- Light Industrial
- Heavy Industrial
- Public/Quasi-Public
- Parks/Open Space
- Lake



General Plan Adopted Nov. 2010

City of Tracy MS4 Permit Boundary Map





Phase 1 Area

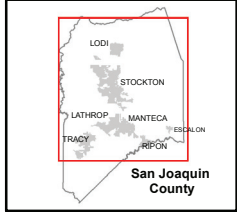


Phase 2 Area



City Limits

1" = 25,620.9'



San Joaquin County NPDES Phase 2 Stormwater Program
 (Phase 2 areas shown are based upon 2010 Census Urban and Rural Classification and Urban Area Criteria)

SAN JOAQUIN COUNTY
 Department of Public Works, 1810 E. Hazelton Ave., Stockton, CA 95205
 The County of San Joaquin does not warrant the accuracy, completeness, or suitability for any particular purpose.
 The information on this map is not intended to replace engineering, financial or primary records research.

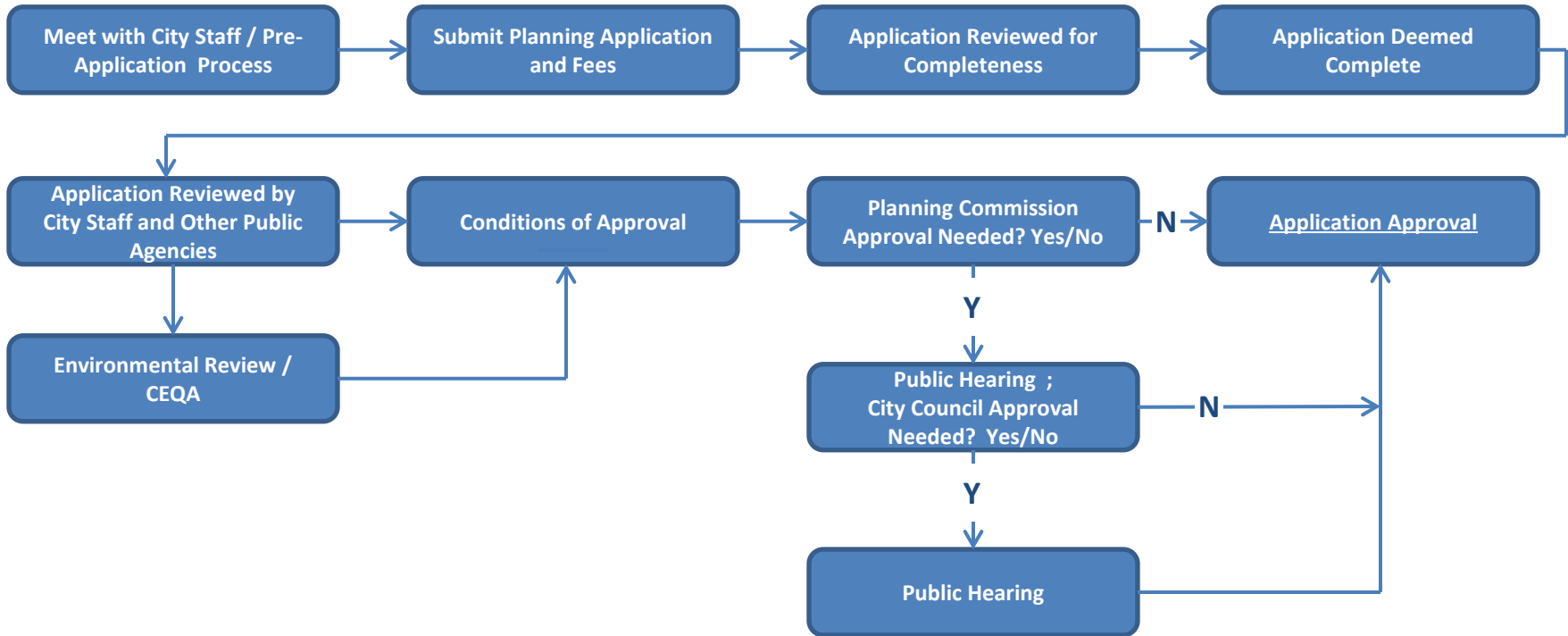
Gerardo Dominguez

APPENDIX C

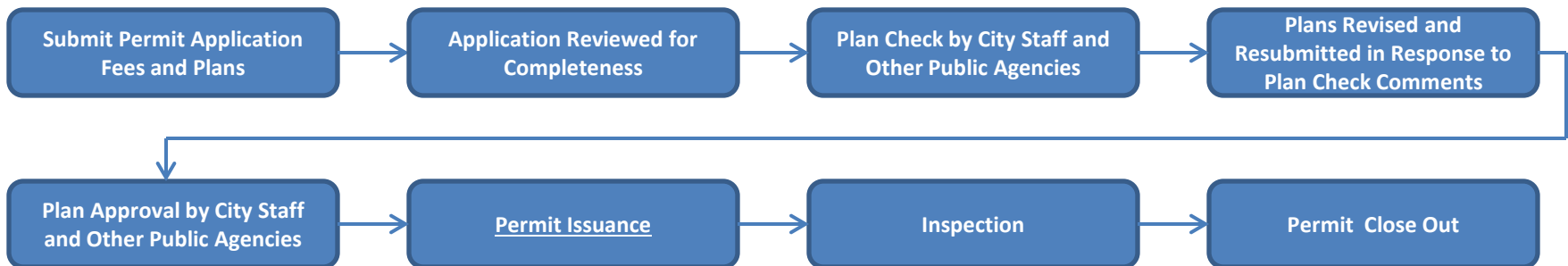
Project Stormwater Plan Review Processes



City of Lathrop Discretionary Approval Process

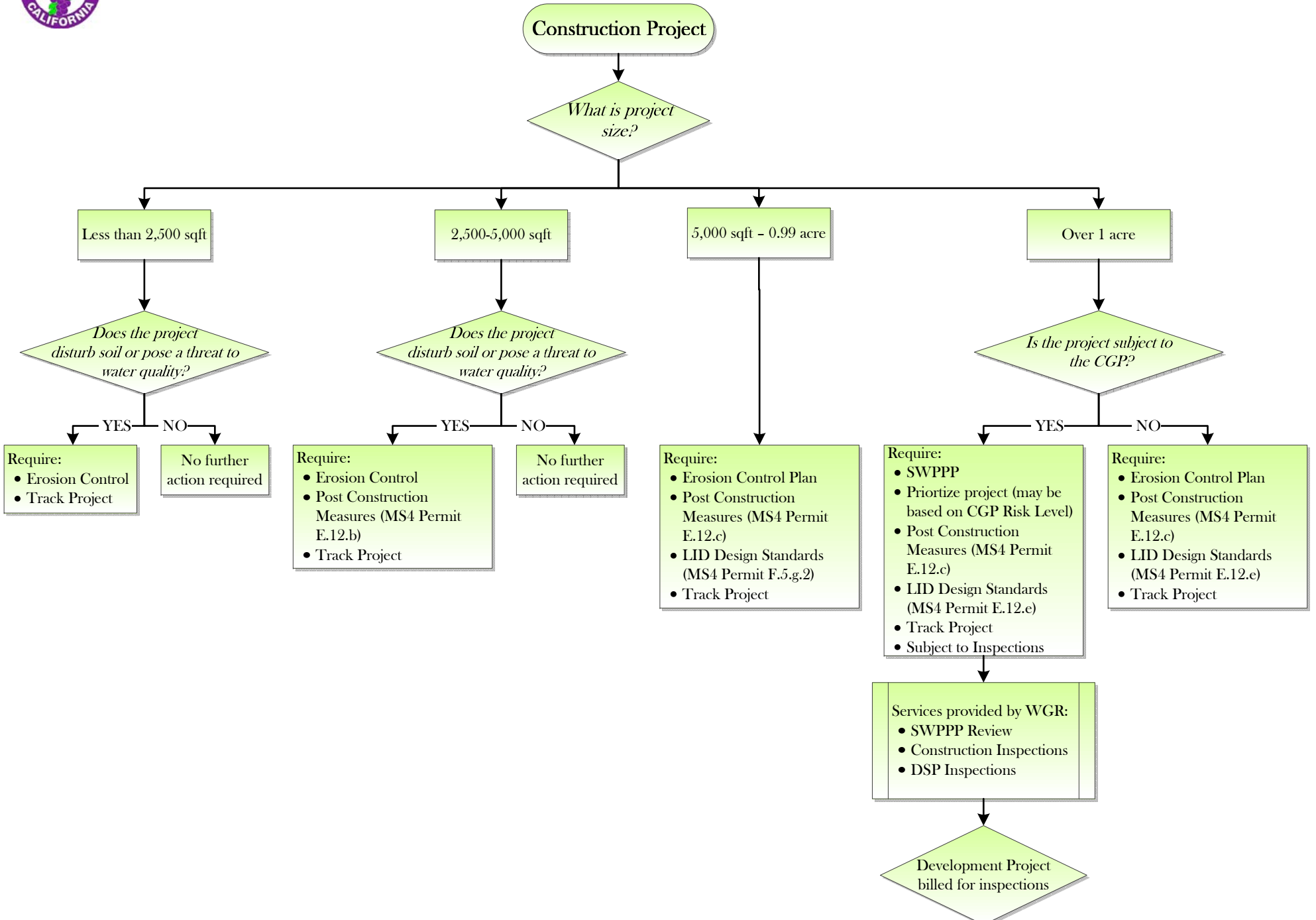


City of Lathrop Building Permit Approval Process



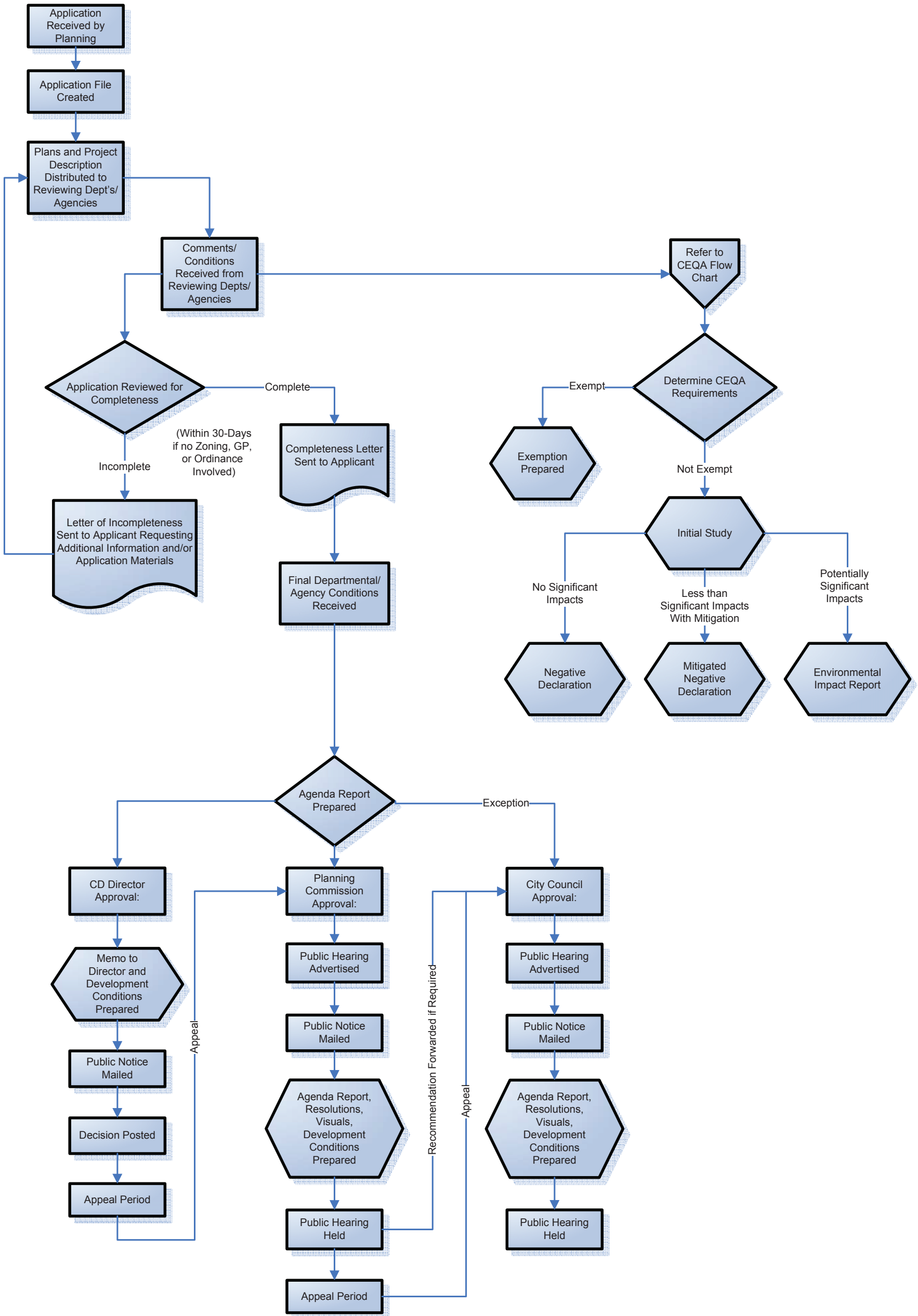


Construction Project Storm Water Compliance

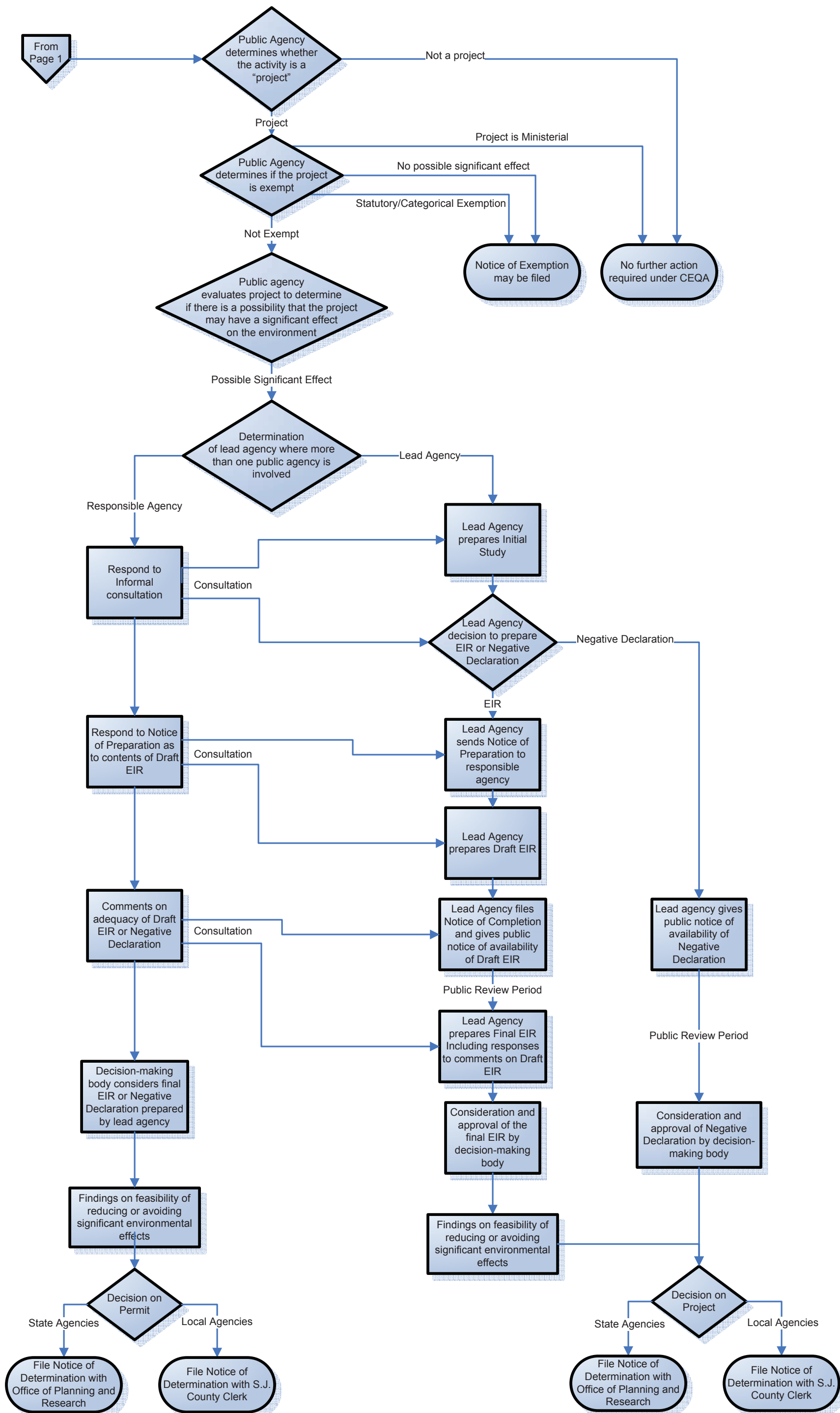


City of Manteca Development Review Process Flow Chart

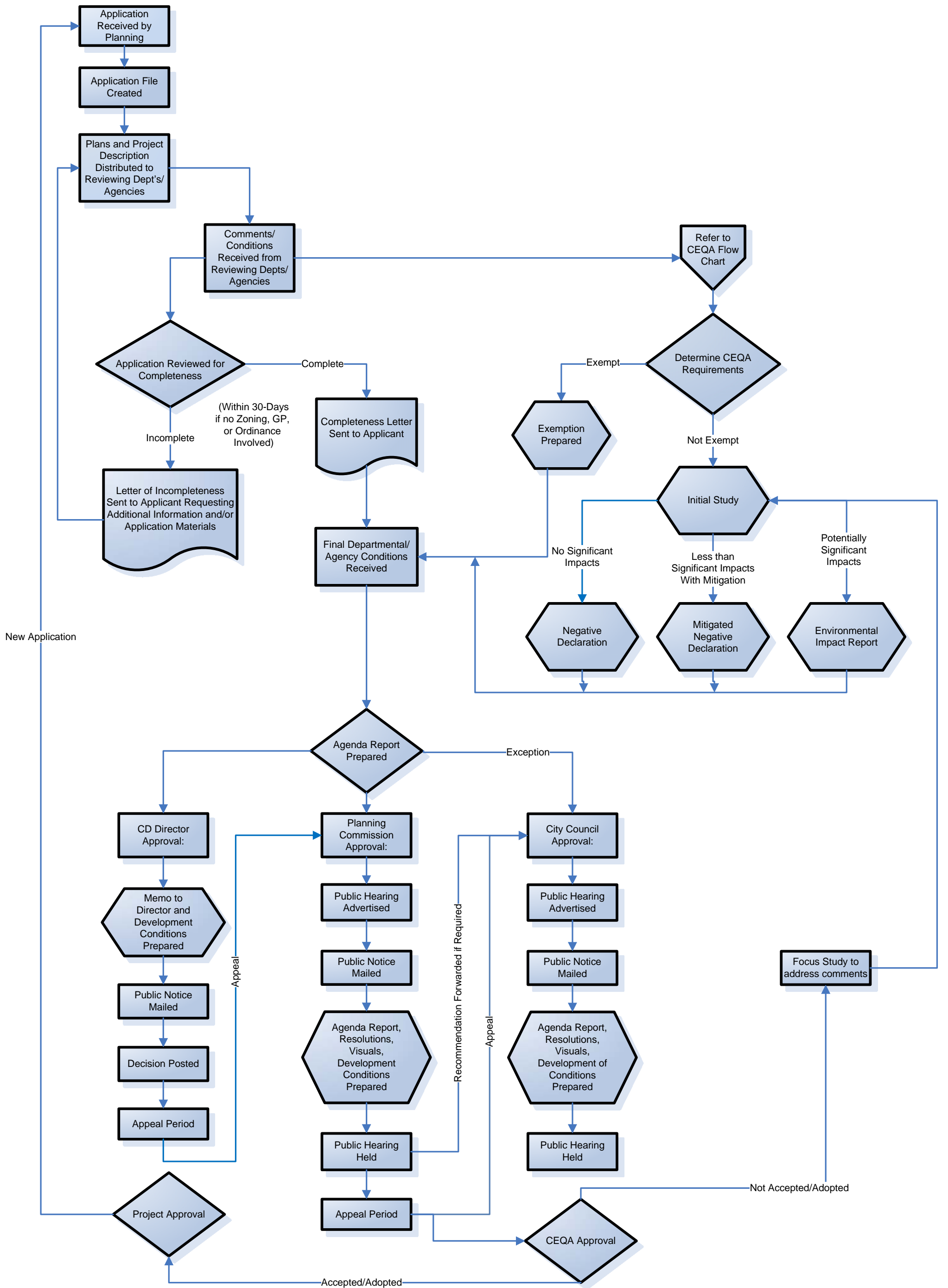
Thursday, January 8, 2009



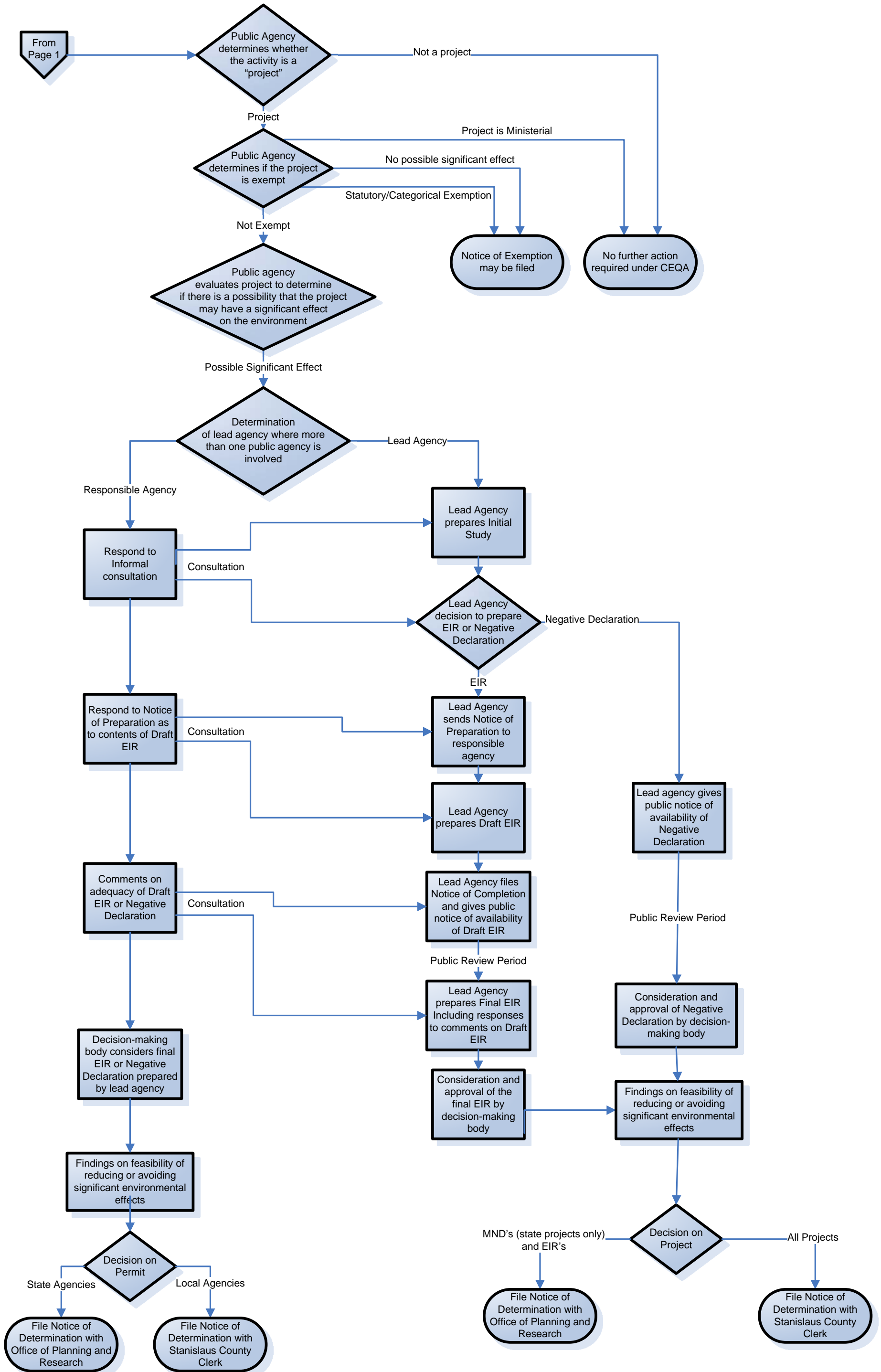
CEQA Process Flow Chart



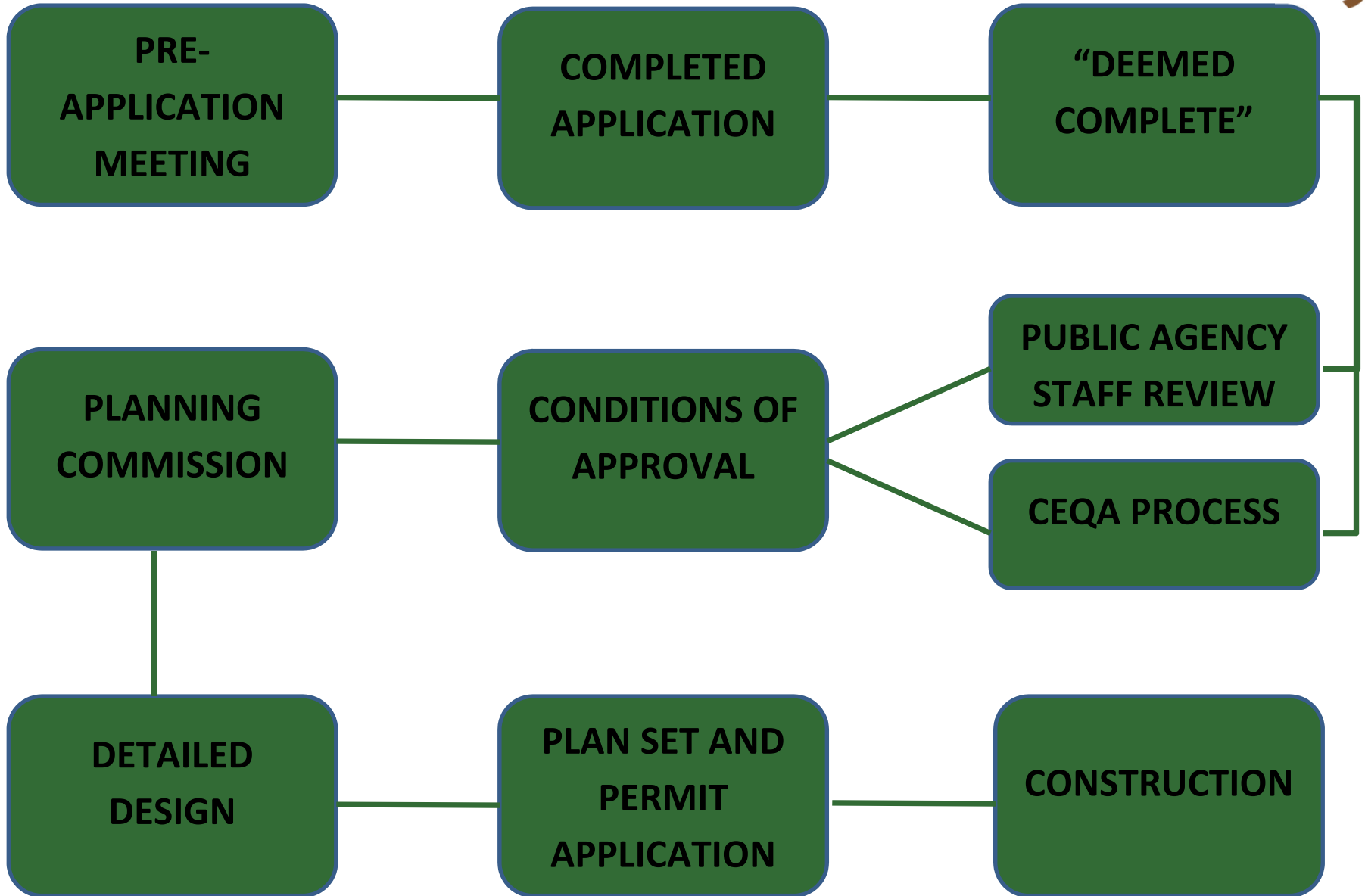
City of Patterson Development Review Process Flow Chart



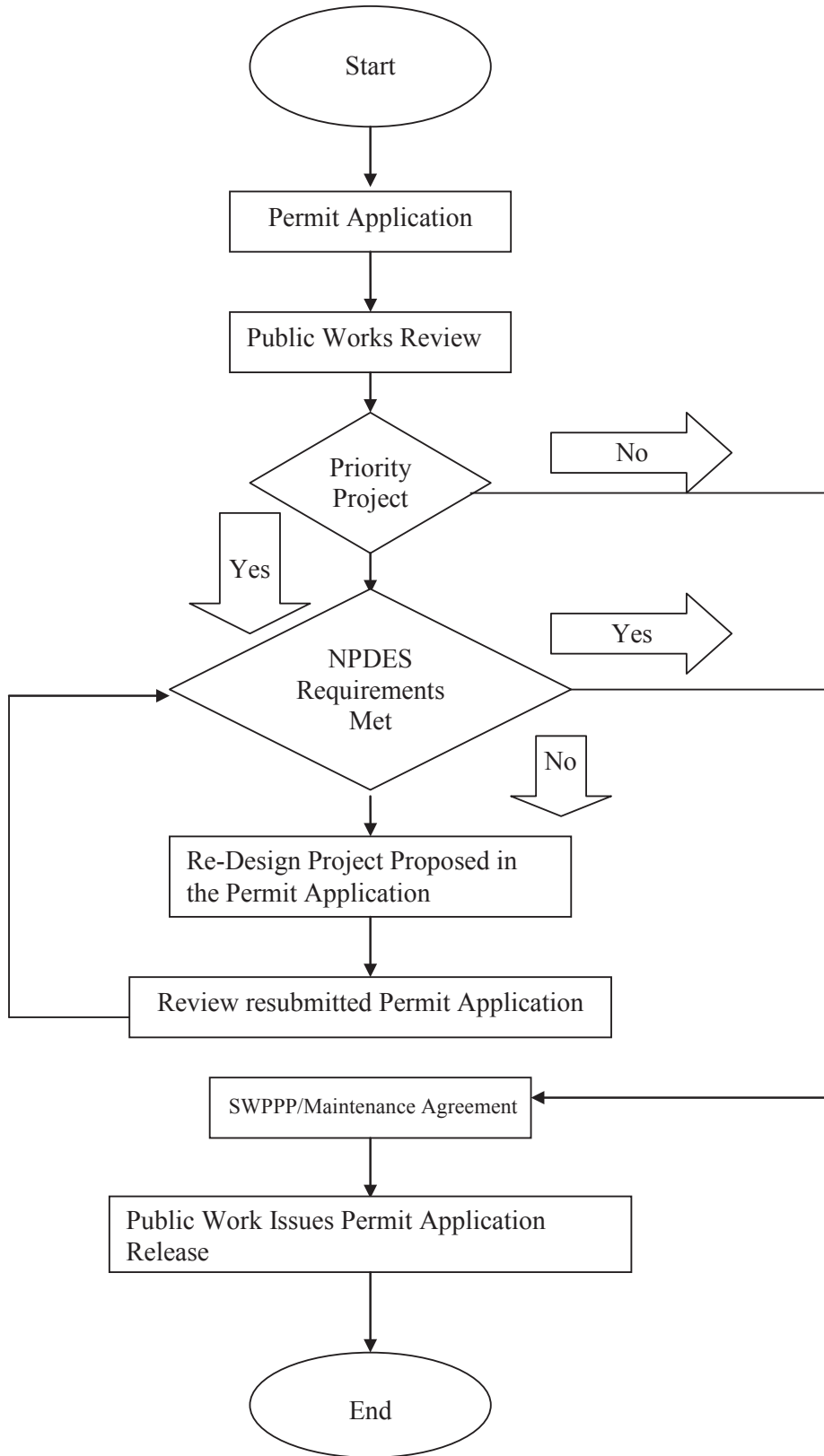
CEQA Process Flow Chart



City of Tracy Development Review Process



San Joaquin County Development Review Process



APPENDIX **D**

Project Stormwater Plan Worksheets

Project Stormwater Plan

for

Project Name

Section 1: Basic Project Information

This worksheet must be filled out for all projects required to implement the *2015 Post-Construction Stormwater Standards Manual*. A licensed professional engineer or landscape architect is not required for the development of the project plan for Small Projects.

Project Site Address	
Owner Information	
Name	_____
Title, if applicable	_____
Company or Affiliation	_____
Address	_____
Telephone Number	_____
Email Address	_____
Professional Engineer/Landscape Architect Information (not required for Small Projects)	
Name	_____
Title	_____
Company or Affiliation	_____
Address	_____
Telephone Number	_____
Email Address	_____
Professional Engineer/ Landscape Architect Stamp and Signature	

Type of Project

Is the proposed project:

- A linear underground/overhead utility project (LUP) that creates and/or replaces at least 2,500, but less than 5,000 square feet of impervious surface?
- A detached single-family home that is not part of a common plan of development?
- A routine maintenance or repair project that maintains the original line and grade, hydraulic capacity, and original purpose of the facility?
 - Exterior wall surface replacement
 - Pavement resurfacing within an existing footprint
 - Replacement of damaged pavement (e.g., pothole repair, short-non-contiguous sections of roadway)
 - Re-roofing regardless of whether it is a full roof replacement or an overlay
- Interior remodels that do not modify the existing footprint?
- Excavation, trenching, and resurfacing associated with LUPs?
- Pavement grinding and resurfacing of existing roadways and parking lots?
- Construction of new sidewalks, pedestrian ramps, or bicycle lanes on existing roadways?
- Construction of sidewalks and bicycle lanes built as part of new streets or roads that are graded to runoff to adjacent vegetated areas?
- Construction of impervious trails that are graded to runoff to adjacent vegetated areas or other non-erodible areas?
- Construction of sidewalks, bicycle lanes, and trails with permeable surfaces?

The above projects are exempt from the requirements of the *2015 Post-Construction Stormwater Standards Manual*. See Section 1.5 of the *2015 Post-Construction Stormwater Standards Manual* for details on project exceptions. Submit Section 1 of the Project Stormwater Plan as part of the application submittal.

Project Stormwater Plan

If the proposed project is not exempt as identified above, identify the type of project:

- Small Project – These are projects that create and/or replace at least 2,500, but less than 5,000 square feet of impervious surface; or detached single-family homes that create and/or replace a minimum of 2,500 square feet of impervious surface and are not part of a larger plan of development.
- Regulated Project – These are projects that create and/or replace greater than or equal to 5,000 square feet of impervious surface and LUPs that create 5,000 square feet or more of newly constructed contiguous impervious surfaces.
 - New development
 - Redevelopment that increases the impervious surface area by 50 percent or more of the existing development
 - Redevelopment that increases the impervious surface area by less than 50 percent of the existing development
- Hydromodification Management Projects – These are projects that create and/or replace one acre or more of impervious surface and result in a net increase of impervious surface

Description of the Project

Provide a description of the proposed project.

Owner Certification and Signature

The undersigned owner of the subject property is responsible for the implementation of the provisions of this Project Stormwater Plan consistent with the requirements of the 2015 Post-Construction Stormwater Standards Manual, [City of _____] [County of San Joaquin] [insert Ordinance citation], and Provision E.12 of the California State Water Resources Control Board Phase II Permit (Order No. 2013-0001-DWQ). If the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement the Project Stormwater Plan. A copy of the final signed and fully approved Project Stormwater Plan shall be available on the subject site throughout the course of the development.

Owner Signature _____

Date _____

Section 2: Small Projects

This worksheet is applicable to only Small Projects.

Small Projects are required to implement at least one site design measure and calculate the change in the pre-project and post-project stormwater runoff using the State Water Resources Control Board's Post-Construction Calculator, which is available at: http://www.swrcb.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml. More information is available in Sections 3.5 and 5.4 of the *2015 Post-Construction Stormwater Standards Manual*.

For the proposed project, identify the following information:

Pre-Project Stormwater Runoff Volume (ft³) _____

Post-Project Stormwater Runoff Volume without credits(ft³) _____

Proposed Site Design Measure	Stormwater Runoff Volume Credit (ft³)
<input type="checkbox"/> Stream setbacks and buffers	_____
<input type="checkbox"/> Soil quality improvement and maintenance	_____
<input type="checkbox"/> Tree planting and preservation	_____
<input type="checkbox"/> Rooftop and impervious area disconnection	_____
<input type="checkbox"/> Porous pavement	_____
<input type="checkbox"/> Vegetated swales	_____
<input type="checkbox"/> Rain barrels/cisterns	_____
Total Stormwater Runoff Volume Credit (ft³)	_____

The project applicant must include a printout of the Post-Construction Calculator results as part of the Project Stormwater Plan.

Section 3: Regulated and Hydromodification Management Projects

The following worksheets are applicable to Regulated and Hydromodification Management Projects.

Site Assessment Worksheet

Regulated and Hydromodification Management Projects are required to assess conditions at the project site. This information is used to plan the project site layout and identify potential sources of pollutants of concern. Complete the Site Assessment Worksheet as part of the Project Stormwater Plan submittal. More information is available in Sections 3.1 and 3.3 of the *2015 Post-Construction Stormwater Standards Manual*.

Site Planning Worksheet

Regulated and Hydromodification Management Projects are required to consider, and implement if feasible, site planning principles to maximize the effectiveness of stormwater management for the project site. Complete the Site Planning Worksheet as part of the Project Stormwater Plan submittal. More information is available in Section 3.4 of the *2015 Post-Construction Stormwater Standards Manual*.

Source Control Measures

Regulated and Hydromodification Management Projects are required to implement source control measures to prevent pollutants from contacting stormwater runoff or prevent discharge of contaminated stormwater runoff from the project site. All proposed projects that include landscape irrigation must implement the source control measure for landscape irrigation described in Section 4 of the *2015 Post-Construction Stormwater Standards Manual*. Complete a Source Control Measures Worksheet as part of the Project Stormwater Plan submittal.

Drainage Management Area Worksheet

Regulated and Hydromodification Projects are required to delineate discrete drainage management areas for a project site and manage stormwater runoff according to those drainage management areas (DMA). Complete the Drainage Management Area Worksheet for each DMA at the project site. More information is available in Section 3.2 of the *2015 Post-Construction Stormwater Standards Manual*.

Site Design Measures

Regulated and Hydromodification Management Projects are required to implement site design measures to the extent technically feasible and calculate the stormwater runoff volume credit using the State Water Resources Control Board's Post-Construction Calculator for each DMA. The Post-Construction Calculator is available at: http://www.swrcb.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml. More information is available in Sections 3.5 and 5.4 of the *2015 Post-Construction Stormwater Standards Manual*. Complete a Site Design Measure Worksheet for each DMA as part of the Project Stormwater Plan submittal.

Stormwater Treatment and Baseline Hydromodification Control Measures

Regulated and Hydromodification Management Projects are required to implement stormwater treatment control measures to manage the portion of the stormwater runoff not mitigated by site design measures. Bioretention is the preferred stormwater treatment control measure unless (1) it is determined to be infeasible and an alternative treatment control measure that is equivalent to bioretention is proposed and justified, or (2) a specific exception applies. More information is available in Sections 5 and 6 of the *2015 Post-Construction Stormwater Standards Manual*. Complete a Stormwater Treatment Control Measure Worksheet for each DMA where proposed site design measures do not fully manage stormwater runoff of the DMA and submit as part of the Project Stormwater Plan.

Other Requirements of the Project Stormwater Plan

In addition to completing the applicable worksheets, Regulated and Hydromodification Management Projects must also include the following information:

- Site Conditions Report, prepared by or under the supervision of a competent, licensed professional, that addresses and discusses relevant findings of the geotechnical evaluation. Geotechnical evaluations must be conducted in accordance with local standards, including, but not limited to, approved investigation, evaluation, and testing methodologies.
- Site Layout Plan that, at a minimum, illustrates:
 - Existing natural hydrologic features (e.g., depressions, watercourses, wetlands, riparian corridors, undisturbed areas) and significant natural resources;
 - Proposed locations and footprints of improvements creating new, or replaced impervious surfaces;
 - Existing and proposed site drainage system and connections to off-site drainage;
 - Proposed locations and footprints stormwater control measures (e.g., site design measures, source control measures, stormwater treatment control measures) implemented to manage stormwater runoff;
 - All DMAs with unique identifiers; and
 - Maintenance areas of the project site.
- Operations and Maintenance Plan

Site Assessment Worksheet

General Project Site Information			
Latitude	_____	Longitude	_____
Total Project Area (A_T) (ft^2)		Elevation _____	
Total Existing Impervious Area (ft^2)	_____	Total Post-Project Impervious Area (ft^2)	_____
Receiving Water(s) _____			
Describe location(s) of discharge from the project site.			

Describe Environmentally Sensitive Areas, if applicable.			

Pollutants of Concern			
Post-Project Land Use Type(s) _____			
Describe expected pollutant-generating activities.			
Pre-project	_____		

Post-project	_____		

Identify pollutants of concern.			

Site Planning Worksheet

Describe how the following site planning principles were considered and implemented in developing and optimizing the site layout for the project.

Define the development envelope and protected areas, identifying areas that are most suitable for development and areas to be left undisturbed.

Concentrate development on portions of the site with less permeable soils and preserve areas that can promote infiltration.

Limit overall impervious coverage of the site with paving and roofs.

Set back development from creeks, wetlands, and riparian habitats.

Preserve significant trees.

Conform the site layout along natural landforms.

Avoid excessive grading and disturbance of vegetation and soils.

Replicate the site's natural drainage patterns.

Detain and retain stormwater runoff throughout the site.

Source Control Measures Worksheet

Describe source control measures to be implemented for each potential pollutant generating activity or source present at the project site. If a potential pollutant generating activity or source is not present at the project site, indicate it as "N/A".

Parking/storage areas and maintenance

Landscape/outdoor pesticide use

Building and grounds maintenance

Refuse areas

Outdoor storage of equipment or materials

Vehicle and equipment cleaning

Vehicle and equipment repair and maintenance

Fuel dispensing areas

Pools, spas, ponds, decorative fountains, and other water features

Source Control Measures Worksheet (cont'd)

Indoor and structural pest control

Accidental spills or leaks

Restaurants, grocery stores, and other food service operations

Interior floor drains

Industrial processes

Loading docks

Fire sprinkler test water

Drain or wash water from boiler drain lines, condensate drain lines, rooftop equipment, drainage sumps, and other sources

Unauthorized non-stormwater discharges

Drainage Management Area Worksheet

Drainage Management Area (DMA) # _____

Type of DMA:

- Self-treating area
- Self-retaining area
- Areas draining to self-retaining areas
- Areas draining to bioretention facility

Describe the DMA _____

Total Drainage Area (ft²) _____

Existing Impervious Area (ft²) _____ Soil Type _____

Post-Project Impervious Area (ft²) _____ Infiltration Rate (in/hr) _____

Mean Annual Runoff-Producing Rainfall Depth (P₆) (in) _____

Drawdown time (t_{max}) (hr) (48) _____

Regression constant (a) (1.963 for 48-hr drawdown) _____

Pre-Project Condition:

Imperviousness ratio (i) = Existing Impervious Area ÷ Total Drainage Area (decimal) _____

Stormwater runoff coefficient (C) = 0.858 x i³ - 0.78 x i² + 0.774 x i + 0.04 _____

Unit stormwater volume (P₀) (in) = a x C x P₆ _____

Stormwater Runoff Volume for the DMA (ft³) _____

Post-Project Condition:

Imperviousness ratio (i) = Post-Project Impervious Area ÷ Total Drainage Area (decimal) _____

Stormwater runoff coefficient (C) = 0.858 x i³ - 0.78 x i² + 0.774 x i + 0.04 _____

Unit stormwater volume (P₀) (in) = a x C x P₆ _____

Stormwater Design Volume for the DMA (SDV) (ft³) = A x P₀ ÷ 12 _____

Site Design Measure Worksheet

Drainage Management Area (DMA) # _____

For this DMA, identify the following information:

Stormwater Design Volume without credits (ft³) = SDV _____

Stormwater Design Volume with credits (ft³) = $SDV_{adj} = SDV - SDM_{credit}$ _____
(This volume must be treated by stormwater treatment control measures.) _____

Do proposed site design measures completely manage the SDV for this DMA?

- Yes, stormwater management requirement met for this DMA.
- No, proceed to Stormwater Treatment and Baseline Hydromodification Measure Worksheet.

Proposed Site Design Measure	Stormwater Runoff Volume Credit (ft³)
<input type="checkbox"/> Stream setbacks and buffers	_____
<input type="checkbox"/> Soil quality improvement and maintenance	_____
<input type="checkbox"/> Tree planting and preservation	_____
<input type="checkbox"/> Rooftop and impervious area disconnection	_____
<input type="checkbox"/> Porous pavement	_____
<input type="checkbox"/> Vegetated swales	_____
<input type="checkbox"/> Rain barrels/cisterns	_____
Total Stormwater Runoff Volume Credit (SDM_{credit})	_____

For site design measures not implemented for this DMA, describe why they are not selected.

Stormwater Treatment and Baseline Hydromodification Control Measure Design Worksheet

For each drainage management area (DMA), in which proposed site design measures did not fully manage the difference in pre- and post-project stormwater runoff volume, complete this worksheet.

Drainage Management Area (DMA) # _____

Design bioretention facility to manage the adjusted stormwater design volume (SDV_{adj}). Calculate the bottom surface area of a bioretention facility:

Stormwater Design Volume for the DMA (SDV) (ft³)
See Drainage Management Area Worksheet. _____

Total Stormwater Runoff Credit Volume (SDM_{credit}) (ft³)
See Site Design Measure Worksheet. _____

Adjusted Stormwater Design Volume (SDV_{adj}) (ft³) = $SDV - SDM_{credit}$ _____

Design infiltration rate of underlying soils (f_{design}) (in/hr) _____

Ponding zone depth (d_{pz}) (ft) (0.5-1.5 ft) _____

Planting media layer depth (d_{pm}) (ft) (min 1.5 ft) _____

Planting media porosity (η_{pm}) _____

Gravel layer depth (d_{gl}) (ft) (min 1 ft) _____

Gravel layer porosity (η_{gl}) _____

Bottom surface area of a bioretention facility (ft²) = $\frac{SDV_{adj}}{d_{pz} + (\eta_{pm} \times d_{pm}) + (\eta_{gl} \times d_{gl})}$ _____

Verify that: $d_{pz} + (\eta_{pm} \times d_{pm}) + (\eta_{gl} \times d_{gl}) \leq f_{design} \times t_{max} \div 12$. If not, redesign factors above.

Verify that the DMA has adequate space to implement bioretention facility sized above. If not, redesign factors above or provide additional stormwater treatment control measures to manage remaining portion of the SDV.

Describe and provide justification for any variations to the bioretention facility for site-specific conditions. See Section 6.2 of the *2015 Post-Construction Stormwater Standards Manual* for more information.

Project Stormwater Plan

Describe and provide justification if an alternative stormwater treatment control measure is proposed in lieu of a bioretention facility. An alternative stormwater treatment control measure proposed for a project must meet all the requirements of Section 6.2 of the *2015 Post-Construction Stormwater Standards Manual*.

Describe and provide justification for any exceptions to the requirements for bioretention. Exception to bioretention must meet all the requirements of Section 6.2 of the *2015 Post-Construction Stormwater Standards Manual*. Identify and describe the proposed biotreatment or media filter system that will be used in lieu of bioretention.

Summary of Stormwater Treatment and Baseline Hydromodification Control Measure Design

Stormwater Design Volume for DMA (SDV) (ft³)

1. Total Stormwater Runoff Credit Volume (SDM_{credit}) (ft³) _____
2. Volume of Stormwater Runoff Managed by Bioretention Facility (ft³) _____
3. Volume of Stormwater Runoff Managed by Other Stormwater Treatment Control Measure (identify each control measure)
 - a. _____
 - b. _____

Total Stormwater Runoff Volume Managed for DMA (ft³) = sum of items 1-3 above. _____

If Total Stormwater Runoff Volume Managed for this DMA equals or exceeds the Stormwater Design Volume for this DMA, then design for stormwater management for this DMA is complete. If the Total Stormwater Runoff Volume Managed for this DMA is less than the Stormwater Design Volume for this DMA, redesign site design measures and stormwater treatment control measures until the entire Stormwater Design Volume for this DMA has been managed. Complete this exercise for each DMA.

Section 4: Hydromodification Management Projects (only)

For projects that create and/or replace one acre or more of impervious surface and result in a net increase of impervious surface, full hydromodification is required. For these projects, the post-construction stormwater runoff flow rate shall not exceed the pre-construction stormwater runoff flow rate for the 2-year, 24-hour design storm event. Hydrologic routing modeling for the drainage management areas (DMAs) must be conducted to calculate the peak stormwater runoff response time and the peak project stormwater runoff flow rate for the entire project site.

Precipitation for 2-year, 24-hour storm event (in) _____

From hydrologic routing modeling:

Pre-Project Total Stormwater Runoff Response Time ($T_{c,pre}$) (min) _____

Pre-Project Peak Stormwater Runoff Flow Rate ($Q_{p,pre}$) (ft^3/s) _____

Post-Project Total Stormwater Runoff Response Time ($T_{c,post}$) (min) _____

Post-Project Peak Stormwater Runoff Flow Rate ($Q_{p,post}$) (ft^3/s) _____

Describe and provide justification for proposed hydromodification management control measures to be implemented to meet the full hydromodification requirements.

Does the project meet the full hydromodification requirements?

- Yes
- No. Re-evaluate proposed hydromodification management control measure and provide additional capacity or implement additional hydromodification management control measure(s) to meet the full hydromodification requirements.

APPENDIX E

Source Control Measure Fact Sheets

Appendix E – Source Control Measure Fact Sheets

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S-1: Accidental Spills and Leaks

Background

Spills and leaks are one of the largest contributors of pollutants in stormwater, and if not properly controlled, can adversely impact the storm drain system and receiving waters. Many activities have the potential for spills (accidental or illegal) and leaks. Proper spill response planning and preparation can result in effective response and mitigation to problems when they occur and potentially minimize the discharge of pollutants into the environment. An effective plan should have spill prevention and response procedures that identify potential spill areas, specify material handling and spill response procedures, and provide spill cleanup equipment and materials. Proper training of personnel is also necessary to prevent or control future spills.

Pollution Prevention Activities and Best Management Practices

A Spill Prevention and Control Plan must be developed to standardize the procedures for preventing, mitigating, and responding to spills on-site, which can discharge to the storm drain system. The Spill Prevention and Control Plan must include the following information:

- Description of the site, site address, owner, owner contact information, and activities and chemicals present on-site;
- Site map, which includes locations where chemicals and/or materials are stored;
- Notification and evacuation procedures;
- Clean-up instructions;
- Identification of appropriate contacts (e.g., owner, operator, regulatory agencies, emergency responders);
- Reporting procedures; and
- Identification of key spill response personnel.

Implement, if feasible, the following BMPs:

- Post “No Dumping” signs with appropriate contact information for reporting illegal dumping and disposal. Signs should also indicate fines and penalties for illegal dumping. Bright lighting and/or entrance barriers may also be used to discourage illegal dumping.
- Store and contain liquid materials such that if the storage unit failed, the contents will not discharge, flow, or be washed into the storm drain system or receiving waters. If necessary, provide secondary containment. If the material stored will separate from and float in water, install a spill control device in the catch basin that collects runoff from the storage tank area.

S-1: Accidental Spills and Leaks

- Regularly inspect tanks and other storage facilities for leaks and spills. Replace tanks that are leaking, corroded, or otherwise damaged with tanks in good condition. Place drip pans or absorbent materials beneath mounted taps and at all potential drip and/or spill locations during filling and unloading storage tanks. Collected liquids or soiled absorbent materials may be reused or recycled or properly disposed of.
- Label all containers according to its contents. Provide hazardous materials labels if necessary.
- Sweep and clean the storage area regularly if it is paved. Do not hose down the area that conveys to a storm drain.
- Provide appropriate spill cleanup materials in a location near the storage facilities.
- Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

In the event that a spill occurs, conduct the following activities:

- Follow the Spill Prevention and Control Plan.
- Clean up spills and leaks immediately. On paved surfaces, use physical and/or dry cleanup methods (e.g., brooms, sweepers, shovels) if possible. Use rags for small spills, a damp mop for general cleanup, and absorbent materials for larger spills. For large spills, specialized contractors may be necessary. Properly dispose of all materials used to clean up spills and leaks.
- Minimize the amount of water used to clean up spills and leaks.
- Report spills to the proper agencies, which may include the following:
 - San Joaquin County Environmental Health Department;
 - Central Valley Regional Water Quality Control Board;
 - State Water Resources Control Board;
 - United States Environmental Protection Agency; and
 - Local fire and/or police department.
- Spill information, such as type of material and quantity, patterns of occurrence, responsible parties, must be recorded.

S-2: Interior Floor Drains

Background

Interior floor drains typically collect process waters, cooling waters, wash waters, and sanitary wastewater. These discharges can carry pollutants such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants into the storm drain system and receiving waters. Pollution prevention activities and BMPs outlined in this fact sheet are designed to reduce and/or eliminate pollutants in potential discharges through interior floor drains.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce potential pollutants that are discharged into the storm drain system through interior floor drains include the following:

- Label interior floor drains, by paint or stencil, to indicate where they flow (e.g., treatment or storage device, sanitary sewer system, storm drain system, receiving water).
- Identify all interior floor drains on a site and/or facility map.
- Remove and properly dispose of trash and debris regularly so they do not enter the floor drain.
- Direct accumulated water from interior floor drains to treatment devices (e.g., oil and water separator) or the sanitary sewer system, if permitted.
- In areas where there are high-risk pollutants or a high risk of pollutant mobilization, seal interior floor drains and use alternative dry methods (e.g., sweeping) or wet vacuums to collect waste.
- Do not store materials that can be washed, blown, or otherwise mobilized near interior floor drains.
- If necessary, verify that interior floor drains do not connect to the storm drain system by smoke and/or dye testing or closed-circuit television inspection.
- Consider hydraulically-isolating interior floor drains with berms.
- Train, including providing periodic refresher training, personnel on proper disposal methods.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Other spill prevention measures include:

- Spot clean leaks and drips routinely to prevent runoff of spillage. Place drip pans or absorbent materials under leaks.
- Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

S-3: Parking and Storage Areas and Maintenance

Background

Parking lots and storage areas may be a source of various pollutants, including trash, solids, hydrocarbons, oil and grease, and heavy metals that may be conveyed by stormwater and non-stormwater runoff to the storm drain system and/or receiving waters. Pollution prevention activities, BMPs, and design considerations outlined in this fact sheet are designed to reduce and/or eliminate pollutants in potential discharges from parking and storage areas.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce the potential pollutants coming in contact with stormwater runoff include the following:

- Label drains, by paint or stencil, to indicate where they flow (e.g., treatment or storage device, sanitary sewer system, storm drain system, receiving water).
- Remove and properly dispose of trash and debris regularly. Post “No Littering” signs and enforce an anti-littering laws.
- Establish a frequency of cleaning and sweeping. Sweep all parking lots at least once before the wet season.
- For wet cleaning, block the storm drain, if present, or contain runoff. Dispose of wash water to a pervious surface or discharge to the sanitary sewer system, if permitted.
- For oily deposits, use absorbent materials prior to sweeping or washing.
- Train, including providing periodic refresher training, personnel on proper maintenance protocols for parking and storage areas.

If repairs to the parking or storage areas are needed, implement the following practices:

- Do not store materials near storm drain inlets. Cover and seal nearby storm drain inlets, where applicable, and manholes before applying seal coat, slurry seal, etc. Leave covers in place until the surface repair activities are completed. Clean and properly dispose of debris from the covered storm drain inlets or manholes.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from stormwater runoff.
- Use the minimum amount of water for dust control to minimize the potentially for site runoff.
- Use absorbent materials or pans to catch drips from paving equipment. Dispose of materials properly.

S-3: Parking and Storage Areas and Maintenance

Design Considerations

For parking and storage areas that may be located in areas with a high risk of pollutant discharge, an impervious surface must be constructed using Portland cement concrete or an equivalent material. For parking and storage areas that may be located in areas with a low risk of pollutant discharge, permeable pavement may be used to help mitigate stormwater runoff volumes.

In general, downspouts and roofs should be directed away from parking and storage areas. To the maximum extent practicable, parking and storage areas should be designed (i.e., graded, bermed) to prevent stormwater run-on and runoff and contain spills. Storm drains should not be located in the immediate vicinity of parking and storage areas. Stormwater runoff, non-stormwater runoff, and spills must be disposed of in accordance with local, state, and federal laws. Design site to convey stormwater runoff from parking and storage areas to a stormwater treatment control measure for treatment.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Other spill prevention measures include:

- Spot clean leaks and drips routinely to prevent runoff of spillage. If the parking or storage area is periodically washed, place a temporary plug in the downstream drain and pump out and properly dispose of accumulated water.
- Place drip pans or absorbent materials under leaks.
- Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

S-4: Indoor and Structural Pest Control

Background

Indoor pest control is unlikely to be a source of pollution in stormwater. Structural pest control, if conducted using chemicals outside of the structure where it is exposed to stormwater runoff may mobilize chemicals into the storm drain system and receiving waters. Pollution prevention activities and BMPs outlined in this fact sheet are designed to reduce and/or eliminate the potential for discharge of pollutants in stormwater runoff from indoor and structural pest control activities.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce the potential pollutants coming in contact with stormwater runoff include the following:

- Implement an integrated pest management (IPM) program, which is a sustainable approach for managing pests by using biological, cultural, physical, and chemical tools.
- Use baits for controlling pests and remove baits if pests are gone.
- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of pesticides and other chemicals and training of applicators and pest control advisors.
- Use pesticides only if there is an actual pest problem and not on a regular preventative schedule.
- Do not use pesticides outdoors if rain is expected. Apply pesticides only when wind speeds are low (less than 5 miles per hour). Calibrate pesticide application equipment to avoid excessive application. Employ techniques to minimize off-target application (i.e., spray drift) of pesticides.
- Do not mix or prepare pesticides for application near storm drains.
- Purchase only the amount of pesticides that can be reasonably used in the given time period (i.e., within expiration period).
- Triple rinse containers and use rinse water as product. Dispose of unused pesticides as hazardous waste. Dispose of empty containers according to the instructions on the label.
- Train, including providing periodic refresher training, personnel on proper use of pesticides. Pesticide application must be conducted under the supervision of a California qualified pesticide applicator. Train and encourage personnel to use of IPM methods to minimize use of chemical treatments.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Other spill prevention measures include:

S-4: Indoor and Structural Pest Control

- Regularly inspect chemical storage containers and application equipment to ensure that they are not leaking. If chemical storage containers are leaking, provide secondary containment. If application equipment is damaged or leaking, repair or if necessary, replace the equipment.
- Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

S-5: Landscape and Outdoor Pesticide Use

Background

Landscape maintenance and outdoor pest control may include the application of herbicides and pesticides. Stormwater and non-stormwater runoff may mobilize herbicides and pesticides into the storm drain system and receiving waters where these chemicals may cause environmental harm to aquatic life. Pollution prevention activities and BMPs outlined in this fact sheet are designed to reduce and/or eliminate the use of herbicides and pesticides in landscape maintenance and outdoor pest control activities that can impact receiving waters and wildlife.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce the potential pollutants coming in contact with stormwater runoff include the following:

- Implement an integrated pest management (IPM) program, which is a sustainable approach for managing pests by using biological, cultural, physical, and chemical tools.
- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of herbicides, pesticides, and other chemicals and training of applicators and pest control advisors.
- Use pesticides only if there is an actual pest problem and not on a regular preventative schedule.
- Do not use herbicides or pesticides if rain is expected. Apply herbicides or pesticides only when wind speeds are low (less than 5 miles per hour). Calibrate herbicide or pesticide application equipment to avoid excessive application. Employ techniques to minimize off-target application (i.e., spray drift) of herbicides and pesticides.
- Do not mix or prepare herbicides or pesticides for application near storm drains.
- Purchase only the amount of herbicides or pesticides that can be reasonably used in the given time period (i.e., within expiration period).
- Triple rinse containers and use rinse water as product. Dispose of unused herbicides or pesticides as hazardous waste. Dispose of empty containers according to the instructions on the label.
- Use mechanical methods, including hand weeding, of vegetation removal rather than herbicides.
- Collect removed vegetation if it is near storm drain inlets by either bagging or manually picking up the material. Otherwise, certain vegetation may be left on-site to allow for decomposition and return of nutrients back into the soils.
- Provide erosion control if soils become exposed.

S-5: Landscape and Outdoor Pesticide Use

- Train, including providing periodic refresher training, personnel on proper use of herbicides and pesticides for landscape maintenance and outdoor use. Pesticide application must be conducted under the supervision of a California qualified pesticide applicator. Train and encourage personnel to use of IPM methods to minimize use of chemical treatments.

Design Considerations

For landscaping, climate-appropriate vegetation must be selected. Generally, climate-appropriate vegetation will reduce the use of herbicides and pesticides and require less irrigation necessary to maintain the health of the vegetation. Design the irrigation system to reduce excessive irrigation runoff in accordance with Section 4 of the 2015 Post-Construction Stormwater Standards Manual.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Other spill prevention measures include:

- Regularly inspect chemical storage containers and application equipment to ensure that they are not leaking. If chemical storage containers are leaking, provide secondary containment. If application equipment is damaged or leaking, repair or if necessary, replace the equipment.
- Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

S-6: Pools, Spas, Ponds, Fountains, and Other Water Features

Background

Pools, spas, ponds, fountains, and other water features may be periodically cleaned, including draining of the water feature, to maintain aesthetic appearances. Waters from these features may contain pollutants of concern (e.g., chlorine, algaecides) that may be toxic to aquatic life if these waters are discharged to the storm drain system or receiving water. Pollution prevention activities and BMPs outlined in this fact sheet are designed to reduce and/or eliminate pollutants in potential discharges from these water features.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce the potential pollutants coming in contact with stormwater runoff include the following:

- Prevent issues with algae through regular maintenance activities including maintaining consistent chlorine levels and water treatment and circulation systems.
- Prevent corrosion of copper pipes by maintaining water chemistry characteristics (e.g., pH, hardness).
- For pools, spas, and fountains:
 - If algae control is needed, use alternatives control methods (e.g., sodium bromide) instead of copper-based algaecides.
 - Do not discharge water to a street or the storm drain system when draining pools, spas, or fountains. If permitted by the Agency, discharge water to the sanitary sewer system. If water is dechlorinated, it may be recycled and used for landscape irrigation.
 - If permitted to discharge to the sanitary sewer, prevent backflow when draining a pool, spa, or fountain by maintaining an air gap between the discharge line and the sanitary sewer pipe (i.e., do not seal the connection between the two lines).
 - Provide drip pans or buckets beneath the drain pipe connections to catch leaks.
 - Do not clean filters in the street or near a storm drain. Rinse filters in a self-treating area (e.g., landscaped or turfed area). If this is not possible, discharge rinse water to the sanitary sewer system, if permitted.
- For ponds and other large water features:
 - Minimize and eliminate, if possible, the use of fertilizers around the water body. Fertilizers can biostimulate algae growth.

S-6: Pools, Spas, Ponds, Fountains, and Other Water Features

- Consider introducing fish species into the pond that consume algae. Contact the California Department of Fish and Wildlife for more information.
- Mechanically remove pond scum (blue-green algae) using a net.
- Discourage the public from feeding wildlife (i.e., place signs that prohibit the feeding wildlife) to control bacteria.
- Control erosion by:
 - Maintaining vegetated cover on the banks to prevent soil erosion. Apply mulch or leave clippings to serve as additional cover for soil stabilization and to reduce the stormwater runoff rate.
 - Designing areas to prevent non-stormwater runoff and erosion.
 - Promoting efficient irrigation practices.
 - Providing energy dissipation along the banks to minimize the potential for erosion.
 - Storing, confining, and covering excavated materials in areas away from ponds.
- Conduct inspections to detect illegal dumping and illicit discharges.
- Remove trash and debris regularly. Provide and maintain trash receptacles. Increase trash collection during peak months.
- Train, including providing periodic refresher training, personnel on proper maintenance protocols for pools, spas, ponds, fountains, and other water features.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks.

S-7: Restaurants, Grocery Stores, and Other Food Service Operations

Background

Restaurants, grocery stores, and other food service operations typically contain multiple areas (e.g., parking lot, trash storage area, outdoor eating areas) that may contribute to pollution of stormwater. Pollutants of concern for stormwater runoff from these facilities include cleaning chemicals, oil and grease, trash, food waste, and pesticides. Pollution prevention activities, BMPs, and design considerations outlined in this fact sheet are designed to reduce and/or eliminate pollutants in potential discharges from these facilities.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce the potential pollutants coming in contact with stormwater runoff include the following:

- Develop standard operating procedures to mitigate and/or eliminate the potential of discharge from food service operations.
- Label drains, by paint or stencil, to indicate where they flow (e.g., treatment or storage device, sanitary sewer system, storm drain system, receiving water).
- In general, use dry cleaning methods (e.g., sweeping) to clean facilities. Regularly remove and properly dispose of trash and litter. Separate recyclable materials from other trash.
- If chemicals are used (e.g., cleaning), purchase the least toxic products available. These chemicals are typically labeled “non-toxic”, “non-petroleum based”, “free of ammonia, phosphates, dye, or perfume”, or “readily biodegradable”. Avoid chlorinated compounds, petroleum distillates, phenols, formaldehyde, and caustic or acidic products. Use water-based products.
- Dispose of all discharge from cooling equipment into the sanitary sewer system and not the street, gutter, or storm drain system.
- Inspect and clean all waste grease removal devices (e.g., grease traps, grease interceptors) to keep them properly functioning.
- Collect oil, grease, and large quantities of oily liquids and properly dispose of it. Do not pour these substances into sinks, floor drains, storm drain system, or sanitary sewer system.
- Install screens and traps in sinks and floor drains to capture large solids. Clean these devices regularly.
- To minimize the potential for pests, keep facility clean and free from food wastes, dispose of trash daily into a closed trash container, properly store all food, and seal gaps in the facility (e.g., doors, windows, walls).

S-7: Restaurants, Grocery Stores, and Other Food Service Operations

- For trash storage areas:
 - Store and transfer all solid and liquid wastes in watertight covered containers. Bag and seal food waste before putting it into the trash container. Do not place uncontained liquids or leaking containers or garbage bags into the trash container.
 - Provide an adequate number of trash containers. Inspect trash containers for damage and replace if necessary. Ensure that trash containers have covers. Lock trash containers to prevent illegal dumping.
 - Do not use water to wash out trash containers. Have the trash container leasing company clean out dirty trash containers.
- For equipment and outdoor cleaning:
 - Clean floor mats and filters in mop sink, floor drain, or proper outside area connected an oil and water separator prior to discharge to the sanitary sewer system. Do not wash these items in the parking lot, alley, sidewalk, or street.
 - Dispose of all wash water into the sanitary sewer system.
- For landscape and grounds maintenance:
 - If pesticides are used, do not over apply or apply when precipitation is forecasted.
 - Do not dispose of pesticides in the sink, floor drains, gutter, street, sanitary sewer system, or storm drain system. Leftover pesticides must either be used up or disposed of as hazardous waste.
 - If fountains are present on-site and algae control is needed, use alternatives control methods (e.g., sodium bromide) instead of copper-based algaecides.
- Train, including providing periodic refresher training, personnel on proper cleaning, disposal, and maintenance protocols.

Design Considerations

All design specifications for restaurants, grocery stores, and other food service operations are regulated by local building and fire codes, ordinances, and zoning requirements. In general, downspouts and roofs should be directed away from the structures, trash storage areas, and cleaning areas. Stormwater runoff, non-stormwater runoff, and spills must be disposed of in accordance with local, state, and federal laws. The following source control measures and their design features may be applicable to restaurants, grocery stores, and other food service operations:

- S-3: Parking/Storage Areas and Maintenance;
- S-4: Indoor and Structural Pest Control;
- S-5: Landscape and Outdoor Pesticide Use;

S-7: Restaurants, Grocery Stores, and Other Food Service Operations

- S-6: Pools, Spas, Ponds, Fountains, and Other Water Features;
- S-8: Refuse Areas
- S-10: Outdoor Storage of Equipment or Materials;
- S-11: Vehicle and Equipment Cleaning;
- S-12: Vehicle and Equipment Repair and Maintenance; and
- S-14: Loading Docks

The project applicant must assess the applicability of the pollution prevention activities, BMPs, and design considerations associated with the source control fact sheets listed above.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Other spill prevention measures include:

- Check trash containers regularly for leaks and replace if necessary.
- Provide drip pans or absorbent materials if drips or leaks are detected.
- Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

Maintenance Requirements

The integrity of structural elements that are subject to damage (e.g., screens, covers, signs) must be maintained by the owner/operator as required by local codes and ordinances. Restaurants, grocery stores, and other food service operations must be inspected periodically to ensure containment of accumulated water, prevention of stormwater run-on, and proper handling of stormwater runoff. Failure to properly maintain building and property may subject the property owner to citation.

S-8: Refuse Areas

Background

Wastes from multi-family, commercial, and industrial sites are typically hauled away for disposal by either public or commercial carriers. Stormwater runoff from areas where trash is stored or handled can be polluted. Loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or receiving waters. Waste handling operations (i.e., dumpsters, litter control, waste piles) may be sources of stormwater pollution. Pollution prevention activities, BMPs, and design considerations outlined in this fact sheet are designed to reduce and/or eliminate pollutants in potential discharges from refuse areas. This source control measure is not intended for single-family detached housing units.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce the potential pollutants coming in contact with stormwater runoff include the following:

- Label drains, by paint or stencil, to indicate where they flow (e.g., treatment or storage device, sanitary sewer system, storm drain system, receiving water).
- Sweep and clean the refuse areas regularly. Do not wash the refuse area if it drains to the storm drain system. If the refuse area is washed down, collect wash water and dispose of it to the sanitary sewer system.
- Provide an adequate number of trash containers. Periodically clean out the trash containers to prevent spillage. Inspect trash containers for damage and replace if necessary. Ensure that trash containers have covers.
- If hazardous chemicals are being stored for disposal, provide secondary containment.

Design Considerations

In designing refuse areas, it is important to note that waste haulers may have specific requirements for the refuse area. The recommendations in this fact sheet are not intended to conflict with the requirements established by the waste hauler. The waste hauler should be contacted prior to the design of trash storage and collection areas to determine established and accepted guidelines for designing trash collection areas. All hazardous waste must be handled in accordance with the legal requirements established in Title 22 of the California Code of Regulations. Refuse areas should be designed as follows:

- Construct/pave outdoor refuse storage and waste handling areas with Portland cement concrete or an equivalent impervious surface. Berm and/or grade the refuse area to prevent run-on, including diverting stormwater runoff from adjoining roofs and pavements away from the refuse area. Locate the refuse area at least 35 feet from storm drains.

- Install a screen or wall around the refuse area to prevent off-site transport of loose trash. Use lined bins or dumpsters to reduce leaking of liquid waste. Use waterproof lids on bins and dumpsters or provide a roof to cover the refuse area to prevent precipitation from entering the containers.
- Post signs on all dumpsters and/or inside the refuse area prohibiting the disposal of liquids and hazardous waste materials in accordance with any Agency waste disposal ordinance.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Other spill prevention measures include:

- Check trash containers regularly for leaks and replace if necessary.
- Provide drip pans or absorbent materials in the refuse area if drips or leaks are detected.
- Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

Maintenance Requirements

The integrity of structural elements that are subject to damage (e.g., screens, covers, signs) must be maintained by the owner/operator as required by local codes and ordinances. Refuse areas must be inspected periodically to ensure containment of accumulated water, prevention of stormwater run-on, and proper handling of stormwater runoff. Failure to properly maintain building and property may subject the property owner to citation.

S-9: Industrial Processes

Background

Industrial processes, particularly if they are located outdoors, have the potential to contaminate stormwater runoff and the receiving waters. Depending on the activities on-site, there may be a variety of potential pollutants of concern. Pollution prevention activities and BMPs outlined in this fact sheet are designed to reduce and/or eliminate pollutants in potential discharges from areas where there are industrial processes.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce the potential pollutants coming in contact with stormwater runoff include the following:

- Label drains, by paint or stencil, to indicate where they flow (e.g., treatment or storage device, sanitary sewer system, storm drain system, receiving water).
- Perform industrial process activities during dry weather periods.
- Consider enclosing the industrial process in a building and connecting the floor drains to the sanitary sewer system.
- Cover the work area with a permanent roof if possible.
- Properly store equipment and materials to prevent contact with stormwater runoff.
- Hydraulically-isolate the industrial process to minimize contact of stormwater runoff and run-on by berming the process area. This will also help contain spills that may occur.
- Clean the industrial process area regularly and properly dispose of all wastes. If possible, use dry cleaning methods. If the industrial process area must be washed, collect wash water and properly dispose of it.
- Regularly remove and properly dispose of trash and litter.
- Use least toxic chemicals when possible.

Design Considerations

All design specifications for industrial processes are regulated by local building and fire codes, ordinances, and zoning requirements. In general, downspouts and roofs should be directed away from industrial processes. Storm drains should not be located in the immediate vicinity of industrial processes. Stormwater runoff, non-stormwater runoff, and spills must be disposed of in accordance with local, state, and federal laws. Depending on the industrial processes on-site, apply other source control measures as needed.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Other spill prevention measures include:

- Regularly inspect equipment and check for leaks and drips. If leaks or drips are detected, repair, if necessary, the equipment, provide drip pans or absorbent materials, and spot clean leaks and drips routinely to prevent runoff of spillage.
- Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

Maintenance Requirements

The integrity of structural elements that are subject to damage (e.g., screens, covers, signs) must be maintained by the owner/operator as required by local codes and ordinances. Industrial process areas must be inspected periodically to ensure containment of accumulated water, prevention of stormwater run-on, and proper handling of stormwater runoff. Failure to properly maintain building and property may subject the property owner to citation.

S-10: Outdoor Storage of Equipment or Materials

Background

Outdoor facilities may be used to store equipment and/or materials. Equipment that is exposed to precipitation may mobilize pollutants. Materials, including raw materials, by-products, finished products, and waste products, stored outdoors can become sources of pollutants in stormwater runoff if not properly managed. Materials may be stored in a variety of ways, including bulk piles, containers, shelving, stacking, and tanks. The type of pollutants associated with equipment and materials stored outdoors will vary depending on the type of activity present on-site. Materials are classified into three categories based on the potential risk of pollutant release associated with stormwater runoff contact – high risk, medium risk, and low risk. General types of materials under each category are presented in **Table E-1**.

Table E-1. Classification of Materials for Potential Pollutant Risk

High Risk Materials	Medium Risk Materials	Low Risk Materials
<ul style="list-style-type: none"> • Recycled materials with discharge potential • Corrosives • Food items • Chalk/gypsum products • Scrap or salvage goods • Feedstock/grain • Fertilizers • Pesticides • Compost • Asphalt • Lime/lye/soda ash • Animal/human wastes • Rubber and plastic pellets or other small pieces • Uncured concrete/cement • Lead and copper, and any metals with oil/grease coating 	<ul style="list-style-type: none"> • Clean recycled materials without discharge potential • Metal (excluding lead and copper, and any metals with oil/grease coating) • Sawdust/bark chips • Sand/soil • Unwashed gravel/rock 	<ul style="list-style-type: none"> • Washed gravel/rock • Finished lumber (non-pressure treated) • Rubber or plastic products (excluding small pieces) • Clean, precast concrete products • Glass products (new) • Inert products • Gaseous products • Products in containers that prevent contact with stormwater (fertilizers and pesticides excluded)

Contamination of stormwater runoff may be prevented by eliminating the possibility of stormwater runoff contact with the equipment and material storage areas either through diversion, cover, or capture of the stormwater runoff. Pollution prevention activities, BMPs, and design considerations outlined in this fact sheet are designed to reduce and/or eliminate pollutants in potential discharges from outdoor equipment and material storage areas.

S-10: Outdoor Storage of Equipment and Materials

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce the potential pollutants coming in contact with stormwater runoff include the following:

- Label drains, by paint or stencil, to indicate where they flow (e.g., treatment or storage device, sanitary sewer system, storm drain system, receiving water).
- Keep the outdoor equipment and material storage area as clean and orderly as possible to reduce the potential for stormwater runoff to contact and/or mobilize potential pollutants of concern.
- Minimize the inventory of materials.
- Identify all storage areas for equipment and chemical and/or waste materials, including a tank/drum schedule indicating tank capacities, materials of construction, and contents, on site maps and/or plans.
- Accurately tracking the materials stored on-site.
- Try to keep materials in their original containers. Provide proper labeling of materials stored on-site.
- Train, including providing periodic refresher training, personnel on proper equipment and material handling procedures.

Design Considerations

All design specifications for equipment and material storage areas are regulated by local building and fire codes, ordinances, and zoning requirements. In general, downspouts and roofs should be directed away from outdoor equipment and materials storage areas. Stormwater runoff, non-stormwater runoff, and spills must be disposed of in accordance with local, state, and federal laws.

Outdoor equipment and material storage areas should be designed as follows:

- For high-risk equipment or materials:
 - Construct/pave storage area with Portland cement concrete or an equivalent impervious surface. Ensure that the surfacing material is chemically-resistant to the materials being stored.
 - Place equipment or materials in an enclosure (e.g., shed, cabinet) that prevents contact with stormwater or cover the entire storage area with a permanent canopy, roof, or awning to prevent precipitation from making contact with and collecting within the storage area. If the cover does not include sidewalls, include a roof overhang that extends beyond the grade break. Covers that are 10 feet high or less should extend a minimum of 3 feet beyond the perimeter of the storage area. Covers higher than 10 feet should extend a minimum of either 20 percent of the cover's height or 5 feet beyond the perimeter of the storage area, whichever is greater.

S-10: Outdoor Storage of Equipment and Materials

- Hydraulically-isolate the storage area with grading, berms, drains, dikes, or curbs to prevent stormwater run-on from surrounding areas or roof drains. Direct stormwater runoff from the cover away from the storage area to an approved stormwater discharge location.
- For medium-risk equipment or materials:
 - Construct/pave storage area with Portland cement concrete or an equivalent impervious surface.
 - At a minimum, completely cover equipment or material with temporary plastic sheeting during storm events.
 - For erodible material, provide grading and a structural containment barrier on at least three sides to prevent stormwater runoff from surrounding areas and migration of material due to wind erosion.
- For low-risk equipment or materials:
 - There are no requirements for surfacing or enclosures or covers.
 - Provide appropriate drainage from the storage area to minimize contact with the equipment or materials.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

Maintenance Requirements

The integrity of structural elements that are subject to damage (e.g., screens, covers, signs) must be maintained by the owner/operator as required by local codes and ordinances. Outdoor equipment and material storage areas must be inspected periodically to ensure containment of accumulated water, prevention of stormwater run-on, and proper handling of stormwater runoff. Any enclosures and secondary/spill containment areas must be checked periodically to ensure spills are contained efficiently. Failure to properly maintain building and property may subject the property owner to citation.

S-11: Vehicle and Equipment Cleaning

Background

Washing vehicles and equipment in areas where wash water flows onto the ground can pollute stormwater runoff and adversely impact receiving waters. Pollutants of concern in wash water include oil and grease, heavy metals, solvents, phosphates, and suspended solids. By containing, collecting, diverting, and properly disposing of wash water from vehicle and equipment cleaning areas to the sanitary sewer system, transport of these potential pollutants to the storm drain system and receiving waters is limited. Pollution prevention activities, BMPs, and design considerations outlined in this fact sheet are designed to reduce and/or eliminate pollutants in potential discharges from vehicle and equipment cleaning areas.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce the potential pollutants coming in contact with stormwater runoff include the following:

- If possible, use properly maintained off-site commercial washing businesses. These businesses are typically better equipped to handle and properly dispose of wash water.
- If it is not possible to wash vehicles and equipment off-site,
 - Use biodegradable, phosphate-free detergent for washing activities.
 - Mark the area clearly as a wash area and that only washing is permitted in this area (e.g., do not allow oil changes and other maintenance to occur in this area).
 - Provide trash containers in the wash area.
 - Label drains, by paint or stencil, to indicate where they flow (e.g., treatment or storage device, sanitary sewer system, storm drain system, receiving water).
 - Use hoses with nozzles that automatically turn off when left unattended.
- Evaluate the feasibility of implementing a closed-loop recycling system that treats and reuses wash water. This type of system will also reduce the use of potable water. Do not discharge wash water into the storm drain system.
- Train, including providing periodic refresher training, personnel on proper cleaning and maintenance procedures.

Design Considerations

All design specifications for vehicle and equipment cleaning areas are regulated by local building and fire codes, ordinances, and zoning requirements. In general, downspouts and roofs should be directed away from vehicle and equipment cleaning areas, and

S-11: Vehicle and Equipment Cleaning

such areas should slope towards a dead-end sump to collect stormwater runoff, non-stormwater runoff, and spills. If a dead-end sump is not used to collect stormwater, install an oil/water separator. Stormwater runoff, non-stormwater runoff, and spills must be disposed of in accordance with local, state, and federal laws. Vehicle and equipment cleaning areas should be designed as follows:

- Construct/pave cleaning areas with Portland cement concrete or an equivalent impervious surface.
- If possible, cover the cleaning area with a permanent canopy, roof, or awning to prevent precipitation from making contact with and collecting within the storage area. If the cover does not include sidewalls, include a roof overhang that extends beyond the grade break. Covers that are 10 feet high or less should extend a minimum of 3 feet beyond the perimeter of the cleaning area. Covers higher than 10 feet should extend a minimum of either 20 percent of the cover's height or 5 feet beyond the perimeter of the cleaning area, whichever is greater. Grade or berm the cleaning area to contain wash water within the covered area.
- If covering the cleaning area is not possible, provide an approved stormwater runoff diversion system along with a clarifier and sample box. Diverted stormwater runoff may require pretreatment and verification of pollutant concentrations.
- Direct wash water to treatment and recycle or pretreatment (e.g., clarifier) and proper connection to the sanitary sewer system. Obtain approval from the proper agency before discharging to the sanitary sewer system.
- Hydraulically-isolate the cleaning area with grading, berms, drains, dikes, or curbs to prevent stormwater run-on from surrounding areas or roof drains. Direct stormwater runoff from the cover away from the cleaning area to an approved stormwater discharge location.
- Do not locate storm drain inlets in the immediate vicinity of the cleaning area.
- Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or accumulated water from entering the storm drain system. All wash water and hazardous and toxic wastes must be prevented from entering the storm drain system.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Other spill prevention measures include:

- Regularly inspect vehicles and equipment for leaks. Place drip pans or absorbent materials under vehicles or equipment if they are leaking.
- Check incoming vehicles and equipment for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site.
- Promptly transfer used fluids to the proper waste or recycling containers. Do not leave full drip pans or other open containers lying around.

S-11: Vehicle and Equipment Cleaning

- Oil filters disposed of in trash cans or dumpsters can leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling container to drain excess oil before disposal. Oil filters can be recycled.
- Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

Maintenance Requirements

The integrity of structural elements that are subject to damage (e.g., covers, signs) must be maintained by the owner/operator as required by local codes and ordinances. Vehicle and equipment cleaning areas must be inspected periodically to ensure containment of accumulated water, prevention of stormwater run-on, and proper handling of stormwater runoff. Failure to properly maintain building and property may subject the property owner to citation.

S-12: Vehicle and Equipment Repair and Maintenance

Background

Activities in vehicle and equipment repair and maintenance areas that can contaminate stormwater runoff include engine repair, service, and parking (e.g., leaking engines or parts). Pollutants of concern from these facilities include oil and grease, solvents, car battery acid, coolant, and gasoline as well as heavy metals and suspended solids. Pollution prevention activities, BMPs, and design considerations outlined in this fact sheet are designed to reduce and/or eliminate pollutants in potential discharges from vehicle and equipment repair and maintenance areas.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce the potential pollutants coming in contact with stormwater runoff include the following:

- Switch to non-toxic chemicals for maintenance when possible and use cleaning agents that can be recycled.
- Minimize the use of solvents. Use water-based solvents for cleaning.
- Recycle used oils and other vehicle or equipment fluids and parts.
- Keep accurate maintenance logs to evaluate materials removed.
- Label drains, by paint or stencil, to indicate where they flow (e.g., treatment or storage device, sanitary sewer system, storm drain system, receiving water). Do not pour waste materials down storm drains.
- Keep vehicles and equipment clean and do not allow a build-up of oil and grease.
- Train, including providing periodic refresher training, personnel on proper area maintenance and waste disposal procedures.

Design Considerations

All design specifications for vehicle and equipment repair and maintenance areas are regulated by local building and fire codes, ordinances, and zoning requirements. In general, downspouts and roofs should be directed away from outdoor vehicle and equipment repair and maintenance areas, and such areas should slope towards a dead-end sump to collect stormwater runoff, non-stormwater runoff, and spills. If a dead-end sump is not used to collect stormwater, install an oil/water separator. Stormwater runoff, non-stormwater runoff, and spills must be disposed of in accordance with local, state, and federal laws. Vehicle and equipment repair and maintenance areas should be designed as follows:

- Construct/pave vehicle and equipment repair and maintenance area with Portland cement concrete or an equivalent impervious surface. Cover or enclose

S-12: Vehicle and Equipment Repair and Maintenance

the vehicle and equipment repair and maintenance area. Where possible, conduct repair and maintenance activities indoors.

- Berm or grade vehicle and equipment repair and maintenance area to prevent stormwater run-on and runoff and contain spills.
- A pretreatment system may be necessary to treat wastes prior to disposal.
- Cover areas where parts and fluids are stored.
- Do not locate storm drains in the immediate vicinity of vehicle and equipment repair and maintenance area.
- Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or accumulated water from entering the storm drain system. All wash water and hazardous and toxic wastes must be prevented from entering the storm drain system.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Other spill prevention measures include:

- Perform all fluid removal or changing inside or under cover to prevent run-on of stormwater and runoff of spills. Use secondary containment (e.g., drain pan, drop cloth) to catch spills or leaks when removing or changing fluids.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site.
- Store wrecked vehicles or damaged equipment under cover.
- Place drip pans or absorbent materials under heavy equipment when not in use.
- Promptly transfer used fluids to the proper waste or recycling containers. Do not leave full drip pans or other open containers lying around.
- Oil filters disposed of in trash cans or dumpsters can leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling container to drain excess oil before disposal. Oil filters can be recycled.
- Store all batteries in secondary containment.
- Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

Maintenance Requirements

The integrity of structural elements that are subject to damage (e.g., covers, signs) must be maintained by the owner/operator as required by local codes and ordinances. Vehicle and equipment repair and maintenance areas must be inspected periodically to ensure containment of accumulated water, prevention of stormwater run-on, and proper handling of stormwater runoff. Failure to properly maintain building and property may subject the property owner to citation.

S-13: Fuel Dispensing Areas

Background

Spills and leaks at fuel dispensing areas can be a significant source of pollution because fuels contain toxic materials and heavy metals that are not easily removed by stormwater treatment control measures. When stormwater runoff mixes with fuel spilled or leaked onto the ground, it becomes contaminated with petroleum-based materials that are harmful to humans, fish, and wildlife. Contamination can occur at large industrial sites or at small commercial sites such as retail gas outlets and convenience stores. Materials such as oil and grease, car battery acid, and coolant also have the potential to contribute to stormwater pollution due to spills at fuel dispensing areas. Pollution prevention activities, BMPs, and design considerations outlined in this fact sheet are designed to reduce and/or eliminate pollutants in potential discharges from fuel dispensing areas.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce the potential pollutants coming in contact with stormwater runoff include the following:

- Provide overflow protection devices on tank systems to warn the operator to automatically shut down transfer pumps when the storage tank reaches capacity.
- Clearly label all valves to reduce the potential for human error.
- Spot clean leaks and drips routinely to prevent runoff of spillage. If the fuel dispensing area is periodically washed, place a temporary plug in the downstream drain and pump out and properly dispose of accumulated water.
- Cover drains during transfer of fuel from the fuel truck to the fuel storage tank.
- Train, including providing periodic refresher training, personnel on proper fueling and cleanup procedures.

Design Considerations

All design considerations for fuel dispensing areas are regulated by local building and fire codes, ordinances, and zoning requirements. In general, downspouts and roofs should be directed away from fuel dispensing areas, and such areas should slope towards a dead-end sump to collect stormwater runoff, non-stormwater runoff, and spills. If a dead-end sump is not used to collect stormwater, install an oil/water separator. Stormwater runoff, non-stormwater runoff, and spills must be disposed of in accordance with local, state, and federal laws. Fuel dispensing areas should be designed as follows:

- Label drains, by paint or stencil, to indicate where they flow (e.g., treatment or storage device, sanitary sewer system, storm drain system, receiving water).

S-13: Fuel Dispensing Areas

- Construct/pave fuel dispensing area with Portland cement concrete, or an equivalent smooth impervious surface. Do not use asphalt concrete to construct/pave the fuel dispensing/maintenance area. The fuel dispensing area is defined as extending 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus 1 foot, whichever is greater. Paving around the fuel dispensing area may exceed the minimum dimensions listed above. Use asphalt sealant to protect asphalt-paved areas surrounding the fuel dispensing area.
- Cover the fuel dispensing area with a permanent canopy, roof, or awning to prevent precipitation from making contact with and collecting within the storage area. Covers that are 10 feet high or less should extend a minimum of 3 feet beyond the perimeter of the fuel dispensing area. Covers higher than 10 feet should extend 5 feet beyond the perimeter of the fuel dispensing area.
- For facilities designed to accommodate very large vehicles or equipment that would prohibit the use of covers, hydraulically-isolate the uncovered fuel dispensing area and direct stormwater runoff from the area through upstream controls to an approved stormwater discharge location.
- Design fuel dispensing area pad with a two to four percent slope to prevent ponding, and include a grade break that separates the area from the rest of the site. Prevent stormwater run-on from surrounding areas or roof drains from entering the fuel dispensing area by:
 - Installing a perimeter trench drain around the fuel dispensing area pad. The perimeter drain must drain to either the sanitary sewer system, if approved, or into an approved below-grade containment vault with at least 60 cubic feet of storage capacity. The containment vault must be emptied, as needed, and the contents disposed of in accordance with applicable laws; and/or
 - Elevating the entire fuel dispensing area pad and provide a perimeter drain to isolate the pad. The pad should be graded such that any spills will stay on the pad for clean up using dry methods.
- Direct stormwater runoff from the cover away from the fuel dispensing area to an approved stormwater discharge location. Do not locate storm drain inlets within 10 feet of the hydraulically-isolated fuel dispensing area.
- Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or accumulated from entering the storm drain system. When possible and appropriate, use dry cleanup methods, such as sweeping for removal of litter and debris and use of absorbents for liquid spills and leaks.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Other spill prevention measures include:

- Install vapor recovery nozzles to help control drips as well as air pollution.

- Discourage “topping-off” of fuel tanks.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Fit the underground storage tanks with spill containment and overfill prevention systems meeting the requirements of Section 2635(b) of Title 23 of the California Code of Regulations.
- Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

Maintenance Requirements

The integrity of structural elements that are subject to damage (e.g., screens, covers, signs) must be maintained by the owner/operator as required by local codes and ordinances. Fuel dispensing areas must be inspected periodically to ensure containment of accumulated water, prevention of stormwater run-on, and proper handling of stormwater runoff. Failure to properly maintain building and property may subject the property owner to citation.

S-14: Loading Docks

Background

Materials spilled, leaked, or lost during loading activities may collect on impervious surfaces or in the soil and be carried away by stormwater runoff or when the area is cleaned. Precipitation can also wash pollutants from machinery used to move materials. In particular, loading docks have the potential to contribute heavy metals, nutrients, suspended solids, oils, and grease to stormwater runoff due to the heavy truck traffic and loading activities. Depressed loading docks (e.g., truck wells) are contained areas that can also accumulate water. Pollution prevention activities, BMPs, and design considerations outlined in this fact sheet are designed to reduce and/or eliminate pollutants in potential discharges from loading docks.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce the potential pollutants coming in contact with stormwater runoff include the following:

- Parking tank trucks and delivery vehicles in designated areas where spills and leaks can be contained.
- Limit exposure of material to precipitation whenever possible.
- Label drains, by paint or stencil, to indicate where they flow (e.g., treatment or storage device, sanitary sewer system, storm drain system, receiving water).
- Develop an operations plan that describes procedures for loading activities.
- Train, including providing periodic refresher training, personnel on proper loading and cleanup procedures.

Design Considerations

All design specifications for loading docks are regulated by local building and fire codes, ordinances, and zoning requirements. In general, downspouts and roofs should be directed away from loading docks, and such areas should slope towards a dead-end sump to collect stormwater runoff, non-stormwater runoff, and spills. If a dead-end sump is not used to collect stormwater, install an oil/water separator. Stormwater runoff, non-stormwater runoff, and spills must be disposed of in accordance with local, state, and federal laws. Loading docks should be designed as follows:

- Construct/pave loading docks with Portland cement concrete or an equivalent impervious surface. Ensure that the surfacing material is chemically-resistant to materials being handled in the loading dock area.
- Cover the loading dock to a distance of at least 10 feet beyond the loading dock or building face if there is no raised dock. If the cover or roof structure does not include sidewalls, then the roof overhang must extend beyond the grade break. The overhang must extend a minimum of 20 percent of the roof height.

- For interior transfer bays, provide a minimum 10-foot “No Obstruction Zone” to allow trucks or trailers to extend at least 5 feet inside the building. Identify “No Obstruction Zone” clearly on site plans and paint zone with high visibility floor paint. If covers or interior transfer bays are not feasible, install a seal or door skirt and provide a cover to shield all material transfers between trailers and building.
- For loading docks, hydraulically-isolate the first six feet of paved area measured from the building or dock face with grading, berms, or drains to prevent stormwater run-on from surrounding areas or roof drains. Direct stormwater runoff and drainage from surrounding areas away from hydraulically-isolated areas to an approved stormwater discharge point.
- For interior transfer bays or bay doors, prevent stormwater runoff from surrounding areas from entering the building with grading or drains. Do not install interior floor drains in the “No Obstruction Zone”. Hydraulically-isolate the “No Obstruction Zone” from any interior floor drains.
- Do not install direct connections to storm drains from depressed loading docks. Connect drains or direct drainage from hydraulically-isolated loading dock to an approved sediment/oil/water separator system connected an approved discharge location. Provide a manual emergency spill diversion valve upstream of separator system to direct flow, in the event of a spill, to an approved spill containment vault sized to contain a volume equal to 125% of largest container handled at the facility. Provide additional emergency means, such as drain plugs or drain covers, to prevent spills or contaminated stormwater runoff from entering the storm drain system.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Other spill prevention measures include:

- Use drip pans underneath hose, and pipe connections and other leak-prone areas during liquid transfer operations.
- Check equipment regularly for leaks, including valves, pumps, and connections.
- Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

Maintenance Requirements

The integrity of structural elements that are subject to damage (e.g., covers, signs) must be maintained by the owner/operator as required by local codes and ordinances. Loading docks must be inspected periodically to ensure containment of accumulated water, prevention of stormwater run-on, and proper handling of stormwater runoff. Failure to properly maintain building and property may subject the property owner to citation.

S-15: Fire Sprinkler Test Water

Background

Water is discharged from fire sprinklers during testing and maintenance. If the water is allowed to leave the site and discharge into the storm drain system, it may mobilize pollutants. Pollution prevention activities and BMPs outlined in this fact sheet are designed to prevent pollutants from entering the storm drain system or receiving waters from discharge of fire sprinkler test water.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce the potential pollutants coming in contact with fire sprinkler test water include the following:

- When preparing for a fire sprinkler test or maintenance, sweep or vacuum the area where the water is anticipated to flow to remove trash and other debris.
- Protect storm drain inlets using sandbags to create a berm to prevent water from flowing into it.
- Temporarily plug other nearby drains.
- Direct fire sprinkler test water to a vegetated area using portable berms and/or sandbags. If a vegetated area is not nearby, create a berm using sandbags to capture water and use a wet-vacuum to collect and dispose of fire sprinkler test water into the sanitary sewer system.
- Train, including providing periodic refresher training, personnel on proper disposal of fire sprinkler test water.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

S-16: Drain or Wash Water

Background

If drain or wash water from boiler drain lines, condensate drain lines, rooftop equipment, drainage sumps, and other sources is allowed to leave a site, the water may mobilize pollutants and enter the storm drain system or receiving water. Pollution prevention activities and BMPs outlined in this fact sheet are designed to prevent pollutants from entering the storm drain system or receiving waters from discharge of drain or wash water from boiler drain lines, condensate drain lines, rooftop equipment, drainage sumps, and other sources.

Pollution Prevention Activities and Best Management Practices

Direct drain or wash water from boiler drain lines, condensate drain lines, rooftop equipment, drainage sumps, and other sources to a vegetated area. If a vegetated area is not nearby, collect the water and dispose of it into the sanitary sewer system. Train, including providing periodic refresher training, personnel on proper disposal of this water.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

S-17: Unauthorized Non-Stormwater Discharges

Background

Non-stormwater discharges are flows that do not consist entirely of stormwater. Some non-stormwater discharges (e.g., uncontaminated groundwater) do not contain pollutants and may be discharged to the storm drain. Other non-stormwater discharges may pose an environmental threat, including discharges originating from illegal dumping internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the storm drain system. These types of discharges, which may include process waters, cooling waters, wash waters, and sanitary wastewater, can carry pollutants such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants into the storm drain system and receiving waters. Pollution prevention activities and BMPs outlined in this fact sheet are designed to eliminate these unauthorized non-stormwater discharges.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may eliminate unauthorized non-stormwater discharges include the following:

- Label drains, by paint or stencil, to indicate where they flow (e.g., treatment or storage device, sanitary sewer system, storm drain system, receiving water).
- Develop protocols for identifying, investigating, and responding to unauthorized non-stormwater discharges. Train personnel, including law enforcement, to identify and document unauthorized non-stormwater discharges.
- Regularly inspect and cleanup hot spots and other storm drain areas where illegal dumping and disposal occurs. During inspections, look for evidence of non-stormwater discharges (e.g., discoloration, odors) and determine if it poses a threat to water quality. Implement proper spill cleanup procedures (S-1: Accidental Leaks and Spills).
- Investigate, and if possible, isolate the source and identify the responsible party, of the non-stormwater discharge. If necessary, conduct smoke and/or dye testing to identify cross-connections and/or use closed-circuit television systems to inspect pipes.
- Collect samples of non-stormwater discharge for water quality testing.
- Provide public education and outreach to reduce the potential for non-stormwater discharges and provide information about proper disposal of waste materials, including liquids. Provide the public with a mechanism (e.g., hotline, website) for reporting instances of non-stormwater discharges.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.

S-18: Building and Grounds Maintenance

Background

Stormwater runoff from building and grounds maintenance activities can be contaminated with pollutants such as hydrocarbons, solvents, fertilizers, pesticides, solids, trash, heavy metals, and oil and grease. Pollution prevention activities, BMPs, and design considerations outlined in this fact sheet are designed to reduce and/or eliminate pollutants in potential discharges from building and grounds maintenance activities.

Pollution Prevention Activities and Best Management Practices

Pollution prevention activities and BMPs that may reduce the potential impacts from buildings and grounds maintenance activities include the following:

- Label drains, by paint or stencil, to indicate where they flow (e.g., treatment or storage device, sanitary sewer system, storm drain system, receiving water).
- Use non-toxic chemicals, including chemicals that can be recycled, for maintenance when possible.
- Remove and properly dispose of trash and debris regularly.
- Recycle materials (e.g., residual paints, solvents, lumber,) as much as possible.
- When washing buildings, rooftops, and other large structures, collect wash water using a sump pump, wet vacuum, or similar device and properly dispose of it. If soaps and detergents are not used, disperse wash water into vegetated areas.
- For building repair, remodeling, and construction:
 - Cover nearby storm drains prior to starting work.
 - Do not discharge any toxic substance or liquid waste on the pavement, ground, or near a storm drain.
 - Use ground or drop cloths under exterior painting, scraping, or sandblasting work. Properly dispose of materials.
 - Clean paintbrushes and tools with water-based paints such that wash water can be disposed of in the sanitary sewer. Paintbrushes and tools with non-water-based paints must be cleaned with solvents, which must be collected and recycled.
- Use mechanical methods, including hand weeding, of vegetation removal rather than herbicides. Provide erosion control if soils become exposed. Recycle yard trimmings on-site.
- For fertilizer and pest management:

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- Implement an integrated pest management (IPM) program, which is a sustainable approach for managing pests by using biological, cultural, physical, and chemical tools.
 - Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers, pesticides, and other chemicals and training of applicators and pest control advisors.
 - Use pesticides only if there is an actual pest problem and not on a regular preventative schedule.
 - Do not use fertilizers or pesticides if rain is expected. Apply fertilizers or pesticides only when wind speeds are low (less than 5 miles per hour). Calibrate fertilizer or pesticide application equipment to avoid excessive application. Employ techniques to minimize off-target application (i.e., spray drift) of fertilizers and pesticides.
 - Do not mix or prepare fertilizers or pesticides for application near storm drains.
 - Purchase only the amount of fertilizers or pesticides that can be reasonably used in the given time period (i.e., within expiration period).
 - Work fertilizers into the soil rather than dumped or broadcast onto the surface. Clean pavement and sidewalk if fertilizer is spilled on these surfaces.
 - Triple rinse containers and use rinse water as product. Dispose of unused fertilizers or pesticides as hazardous waste. Dispose of empty containers according to the instructions on the label.
- Collect removed vegetation if it is near storm drain inlets by either bagging or manually picking up the material. Otherwise, certain vegetation may be left on-site to allow for decomposition and return of nutrients back into the soils.
 - Train, including providing periodic refresher training, personnel on proper procedures for conducting building and grounds maintenance activities. This training should also include proper use of chemicals.

Design Considerations

For landscaping, climate-appropriate vegetation must be selected. Generally, climate-appropriate vegetation will reduce the use of fertilizers, pesticides, and other chemicals and require less irrigation necessary to maintain the health of the vegetation. Design the irrigation system to reduce excessive irrigation runoff in accordance with Section 4 of the 2015 Post-Construction Stormwater Standards Manual.

Spill Prevention and Response

Refer to S-1 for Accidental Spills and Leaks. Other spill prevention measures include:

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- Regularly inspect chemical storage containers and application equipment to ensure that they are not leaking. If chemical storage containers are leaking, provide secondary containment. If application equipment is damaged or leaking, repair or if necessary, replace the equipment.
- Train, including providing periodic refresher training, personnel on spill prevention and cleanup procedures.