Project Stormwater Plan

for

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.

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 Lathrop Ordinance §13.28.130.C, 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 <u>at least</u> 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 (ft^3)   _____

Post-Project Stormwater Runoff Volume without credits(ft^3)   _____

Proposed Site Design Measure	**Stormwater Runoff Volume Credit (ft^3)**
☐ Stream setbacks and buffers	_____
☐ Soil quality improvement and maintenance	_____
☐ Tree planting and preservation	_____
☐ Rooftop and impervious area disconnection	_____
☐ Porous pavement	_____
☐ Vegetated swales	_____
☐ Rain barrels/cisterns	_____
Total Stormwater Runoff Volume Credit (ft^3)	_____

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 manage the 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 _____ Elevation _____

Total Project Area (A_T) (ft^2) _____

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 ☐ Areas draining to self-retaining areas

☐ Self-retaining area ☐ Areas draining to bioretention facility

Describe the DMA _____

_____

Total Drainage Area (ft^2) _____

Existing Impervious Area (ft^2) _____ Soil Type _____

Post-Project Impervious Area (ft^2) _____ Infiltration Rate (in/hr) _____

Mean Annual Runoff-Producing Rainfall Depth (P_6) (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) = $0.858 \times i^3 - 0.78 \times i^2 + 0.774 \times i + 0.04$ _____

Unit stormwater volume (P_0) (in) = $a \times C \times P_6$ _____

Stormwater Runoff Volume for the DMA (ft^3) _____

Post-Project Condition:

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

Stormwater runoff coefficient (C) = $0.858 \times i^3 - 0.78 \times i^2 + 0.774 \times i + 0.04$ _____

Unit stormwater volume (P_0) (in) = $a \times C \times P_6$ _____

Stormwater Design Volume for the DMA (SDV) (ft^3) = A x P_0 ÷ 12 _____

Site Design Measure Worksheet

Drainage Management Area (DMA) # _____

For this DMA, identify the following information:

Stormwater Design Volume without credits (ft^3) = SDV

Stormwater Design Volume with credits (ft^3) = 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 (ft^3)**
☐ Stream setbacks and buffers	_____
☐ Soil quality improvement and maintenance	_____
☐ Tree planting and preservation	_____
☐ Rooftop and impervious area disconnection	_____
☐ Porous pavement	_____
☐ Vegetated swales	_____
☐ 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 <u>each</u> 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) (ft^3)
See Drainage Management Area Worksheet. _____

Total Stormwater Runoff Credit Volume (SDM$_{credit}$) (ft^3)
See Site Design Measure Worksheet. _____

Adjusted Stormwater Design Volume (SDV$_{adj}$) (ft^3) = 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 (ft^2) = $\dfrac{SDV_{adj}}{d_{pz}+(\eta_{pm}\times d_{pm})+(\eta_{gl}\times d_{gl})}$ _____

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.

_____

_____

_____

_____

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) (ft^3)   _____

    1. Total Stormwater Runoff Credit Volume (SDM_{credit}) (ft^3)   _____

    2. Volume of Stormwater Runoff Managed by Bioretention Facility (ft^3)   _____

    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 (ft^3) = 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.