

# WATER QUALITY MANAGEMENT PLAN (WQMP)

For compliance with Santa Ana Regional Water Quality Control Board  
Order Number R8-2002-0012 (NPDES Permit No. CAS618036)

For:

**Prologis Park**  
Valley and Commerce  
Fontana, CA  
Northwest corner of  
Valley Blvd and Commerce Center Drive

Grading Permit Number \_\_\_\_\_

*Prepared For:*

**Prologis Logistics Services Inc.**  
**4041 MacArthur blvd, Suite 400**  
**Newport beach, CA 92660**  
Phone (949) 251-6111  
Fax (949) 852-1679

*Prepared By:*

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**WQMP Preparation Date**

Prepared: May 13, 2011

**WDID No.**

JN 08684

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## Project Site Information

Name of Project: **Prologis Park**

Project Location: Northwest Corner of Valley Blvd and Commerce  
Center Drive  
San Bernardino County  
Fontana Region

Size of Significant Re-Development  
on an Already Developed Site (in feet<sup>2</sup>): **N/A**

Size of New Development (in feet<sup>2</sup>): **394,339 SF (9.05 Acres)**

Number of Buildings Subdivisions: **1 building on 1 parcel**

SIC Codes: 4225 General Warehousing

Erosive Site Conditions?: **None**

Natural Slope More Than 25%?: **0 ac**

## Project Category

Check the appropriate project category below:

<i>Check below</i>	<b>Project Categories</b>
	1. All significant re-development projects. Significant re-development is defined as the addition or creation of 5,000 or more square feet of impervious surface on an already developed site. This includes, but is not limited to, additional buildings and/or structures, extension of existing footprint of a building, construction of parking lots, etc. Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to SUSMPs, the design standards apply only to the addition, and not the entire development. When the redevelopment results in an increase of more than fifty percent of the impervious surfaces, then a WQMP is required for the entire development (new and existing).
	2. Home subdivisions of 10 units or more. This includes single family residences, multi-family residence, condominiums, apartments, etc.
✓	3. Industrial/commercial developments of 100,000 square feet or more. Commercial developments include non-residential developments such as hospitals, educational institutions, recreational facilities, mini-malls, hotels, office buildings, warehouses, and light industrial facilities.
	4. Automotive repair shops (with SIC codes 5013, 5014, 5541, 7532- 7534, 7536- 7539).
	5. Restaurants where the land area of development is 5,000 square feet or more.
	6. Hillside developments of 10,000 square feet or more which are located on areas with known erosive soil conditions or where the natural slope is twenty-five percent or more.
	7. Developments of 2,500 square feet of impervious surface or more adjacent to (within 200 feet) or discharging directly into environmentally sensitive areas such as areas designated in the Ocean Plan as areas of special biological significance or waterbodies listed on the CWA Section 303(d) list of impaired waters.
✓	8. Parking lots of 5,000 square feet or more exposed to storm water. Parking lot is defined as land area or facility for the temporary storage of motor vehicles.
	The project does not fall into any of the categories described above. (If the project requires a precise plan of development [e.g. all commercial or industrial projects, residential projects of less than 10 dwelling units, and all other land development projects with potential for significant adverse water quality impacts] or subdivision of land, it is defined as a Non-Category Project.)

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## Section 1 – Introduction and Project Description

### 1.1 Project Information

- Name of Project Owner: **Prologis Logistics Services Inc.**
- Address of Project Owner: 4041 MacArthur blvd, Suite 400  
Newport beach, CA 92660
- Phone Number of Owner: Phone (949) 251-6111
- Fax (949) 852-1679
- Project Site Address Northwest corner of Valley Blvd and Commerce Center  
Drive  
Fontana, CA
- WQMP manager as assigned by owners

Name of individual **Scott Mulkay**  
Company name **Prologis Logistics Services Inc.**

Address 4041 MacArthur blvd, Suite 400  
Newport beach, CA 92660

Phone (909) 673-8700

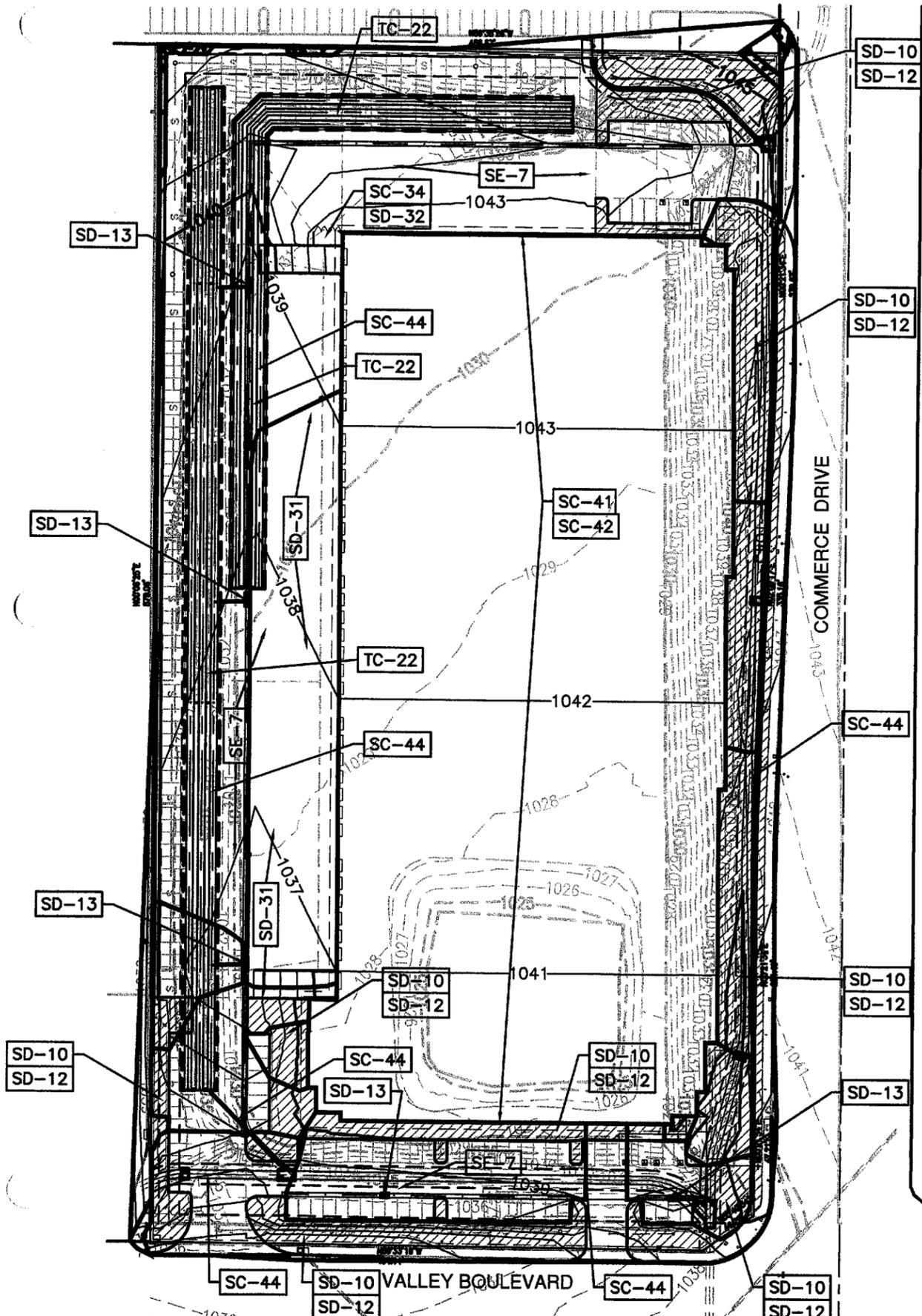
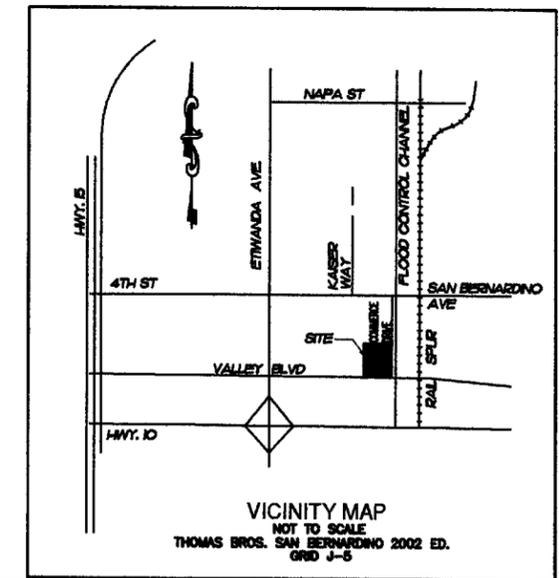
WQMPPM 24hr Phone (949) 355-5278

### 1.2 Permits –

- **Grading Permit Number**
- **Building permit**
- **Storm Drain Encroachment permit**

# WATER QUALITY MANAGEMENT PLAN

PROLOGIS



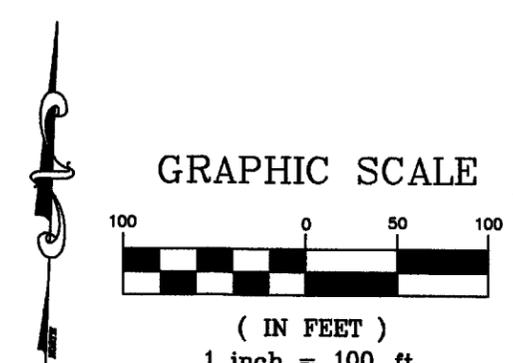
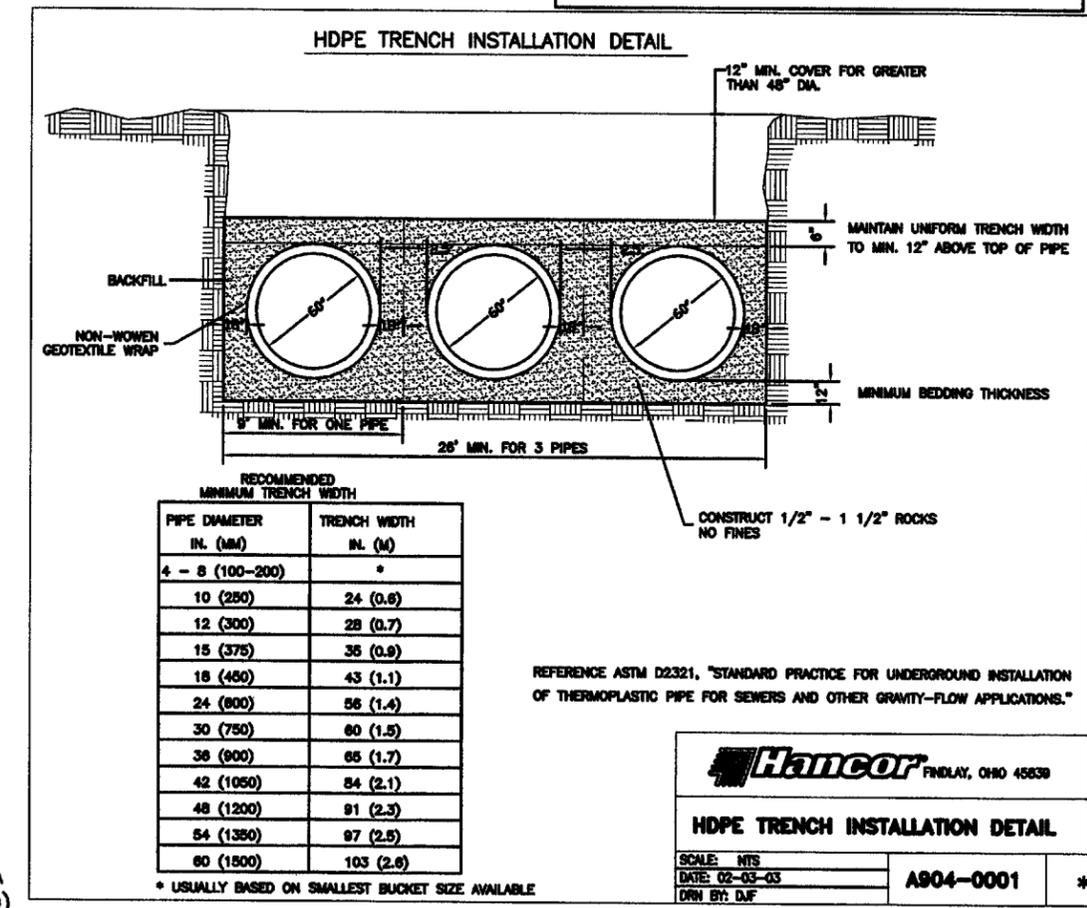
**BMPs**

- ← SC-10 NON-STORMWATER DISCHARGES
- ← SC-11 SPILL PREVENTION, CONTROL AND CLEANUP
- ← SC-34 WASTE HANDLING AND DISPOSAL
- ← SC-35 SAFER ALTERNATIVE PRODUCTS
- ← SC-41 BUILDING AND GROUNDS MAINTENANCE
- ← SC-42 BUILDING REPAIR, REMODELING, AND CONSTRUCTION
- ← SC-43 PARKING/STORAGE AREA MAINTENANCE
- ← SC-44 DRAINAGE SYSTEM MAINTENANCE
- ← SD-10 SITE DESIGN AND LANDSCAPE PLANNING
- ← SD-12 EFFICIENT IRRIGATION
- ← SD-13 CATCH BASIN SIGNAGE
- ← SD-31 MAINTENANCE BAYS AND DOCKS
- ← SD-32 TRASH ENCLOSURES
- ← SE-7 STREET SWEEPING AND VACUUMING
- ← TC-22 EXTENDED DETENTION BASIN

**BMPs THAT APPLY TO THE ENTIRE SITE**

- ← SD-34 OUTDOOR MATERIAL STORAGE AREAS
- ← SD-35 OUTDOOR WORK AREAS
- ← SD-36 OUTDOOR PROCESSING AREAS
- ← WM-4 SPILL PREVENTION AND CONTROL
- ← SC-41 BUILDING/GROUNDS MAINTENANCE
- EMPLOYEE TRAINING

- (110) MAINTAIN GRATING CATCH BASIN PER APWA STD. 304-2 (W=2.95' UNLESS OTHERWISE NOTED)
- (111) MAINTAIN DUAL GRATING CATCH BASIN PER APWA STD. 304-2 (W=6.4' UNLESS OTHERWISE NOTED)



DEVELOPER  
PROLOGIS  
4041 MACARTHUR BLVD  
SUITE 400  
NEWPORT BEACH, CA 92660  
TEL: 949-251-6111

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WATER QUALITY MANAGEMENT PLAN  
PROLOGIS  
VALLEY BLVD. AND COMMERCE DR.

SHEET 1 OF 1

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### 1.3 Project Description

Contractors: **Prologis Logistics Services Inc.**

Land Use Type: Zoned **Kaiser Commerce Center Specific Plan**  
Proposed usage **Shipping Warehouse**

#### **Categories**

Industrial/commercial developments of 100,000 square feet or more.  
Parking lots of 5,000 square feet or more exposed to storm water.

Project Size:  
**394,339 SF (9.05 Acres)**

#### **Responsibility**

This is a single owner site, no property owners association formation.

Management of the site will be the responsibility of Prologis Logistics Services Inc., the current owners of the site. The above-named individual(s) will be responsible for management of the WQMP until a tenant is assigned the responsibility in a lease agreement or in case of a sale, a new ownership.

#### **Extent of Grading**

The proposed grading for the development includes import for grading of 118,255 cubic yards of earthwork with fill of up to 17 feet, not including overexcavation required by the soils engineer.

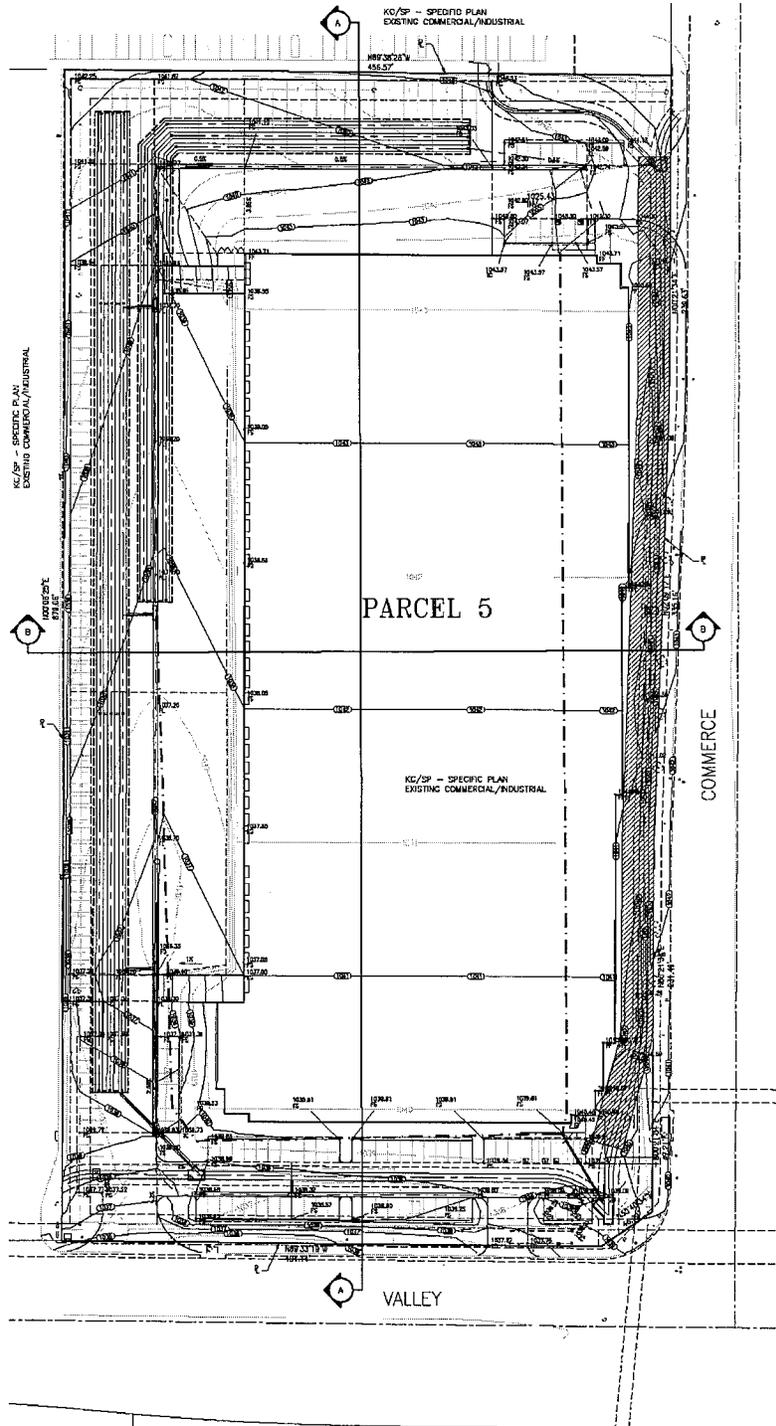
The grading plan of the SMC Building Expansion site includes some grading on this site that is required to serve as the detention basin for the SMC site. This site previously served as that detention basin. This basin was necessary to mitigate peak flows from the SMC site due to previous downstream restrictions in the San Sevaine Channel. The restrictions on the San Sevaine Channel have recently been lifted, and therefore new grading of the site will occur. The temporary detention basin will be filled in and graded to pad level. The new drainage for runoff from the SMC Building Expansion site will now be put into Hancor pipe in a rock base and placed underground.

To meet the WQMP requirements for this site, an underground infiltration system is also being constructed site with the required holding capacity for this site in a separate system. the SMC site will have its own separated system maintained by the SMC site maintenance for the WQMP See below in ‘Storm Drain for the Site’

#### **Description of Project Facility**

The new construction includes a forty-five foot tall single story structure with a footprint of 171,300 square feet and a total area of 186,300 square feet with the mezzanine. The building is a

concrete tilt-up structure supported by a conventional slab-on-grade foundation system with dock high doors on the west side of the structure. The outside dimensions of the structure will be 652 ft long by 285 ft, located on the easterly side of the 865 ft long by 452 ft wide 9 acre parcel.



Conceptual design of site including underground storage.

This is a dock high building set four feet above the surrounding grades for trucking and the drive lanes around the 3 sides. The truck loading docks on the west elevations are partially inset a distance of 60 ft from the face of the building and take up over three-quarters of the west face of the building, with an office pods located at the southeast and possibly in the southwest corner.

Parking is along the north, south and west perimeter of the site for trucks and automobiles. Parking for automobiles is primarily on the south side with a row along the north end of the site. Truck and trailer parking is on the west side. The parking surrounds the building except on the east by placing the parking against the property lines on 3 sides. Drive aisles are oversized to accommodate truck traffic and site logistics.

Fences are along the north drive and west drive, with a security gate at the southwest corner of the loading docks. A security wall along the north and west property lines will retain the adjacent grades with fencing on top of the wall for security.

### **Storm Drain for the Site**

An underground system is previously reserved for the SMC site. This was constructed for the original building and paved areas. The storm drain utilizes the existing system in Commerce Center Drive for the purpose of transporting the storm water to this site. The storm drain system on the site is to be relocated and redesigned. The plans have recently been approved by the San Bernardino County flood control district.

The detention basin that occupied this site at the northwest corner of Commerce Drive and Valley Blvd. was needed for the mitigation of peak flows due to downstream restrictions on the San Sevaine channel. The restrictions on the San Sevaine Channel were recently lifted, and new grading of this site will take place. This will be replaced by a Hancor perforated pipe detention system placed under the pavement for the SMC site and another one for this site of similar size and similar location. See site plan for location of the new detention areas.

The existing detention basin will no longer be used to mitigate water from the SMC Building Expansion site. The existing detention basin on this remote site is to be filled in and an infiltration system utilizing Hancor LandMax pipe will be installed within the northeastern corner of the site for the SMC Building Expansion. This will handle the flow by storm drain. Drainage will now be mitigated by the new infiltration system and remaining water will be transported by the new storm drain pipe along the eastern side of the Commerce Dr./Valley Blvd. site. This storm drain will then empty to the San Sevaine Channel.

The new development for this site will include a Hancor system of its own with storm drain located in various locations. All of this will drain towards the Hancor system then after it surpasses the minimum flows it will overflow to the San Sevaine system.

The detention system design for this site will create another Hancor pipe drainage system similar to the SMC system.

The detention system designed for this site is located along the west property line and is approximately 500 ft long. This will have three- sixty inch diameter perforated HDPE pipes in a rock base. (refer to the site plan for locations)

### **Water Quality for the Site**

The Hancor landmax pipe and rock provides the drainage and first flush requirements for water quality.

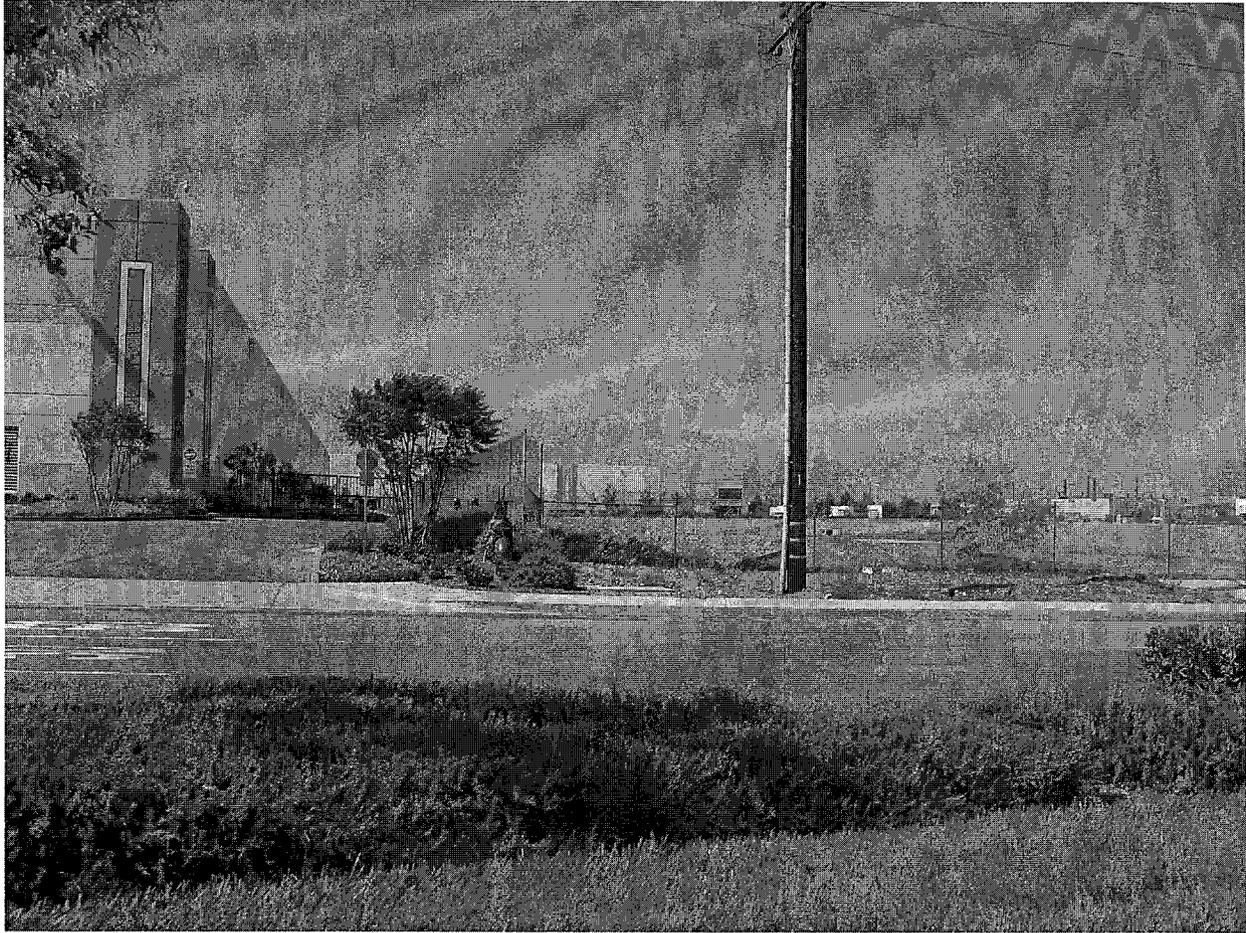
Since the site is mostly paved and landscaped, very little sediment is expected once the project is occupied. Regular parking lot sweeping and good housekeeping will account for the remaining controls for the water quality of the storm water.

The Hancor detention system will replace the open air detention area originally constructed for the SMC site with a similar pipe system proposed for mitigation of this site.

## 1.4 Site Description

The property is located in the southwestern portion of San Bernardino County, in the vicinity of the city of Fontana. The site is at the northwest corner of Valley Blvd and Commerce Center Drive, approximately 2,000 feet east of Etiwanda Avenue, north of interstate 10.

The site is generally flat, with little topographic relief. The generally rectangular shaped parcel has a north-to-south orientation, with topography of the relatively level parcel descending approximately eleven feet from north to south



View of existing site looking northerly towards southwest corner of site



View of site looking southerly along east property line

#### **1.4.1 Project Watershed**

The project site is located in the Santa Ana River Watershed. The drainage is tributary to the San Sevaine Channel. This then flows south, eventually connecting to the Santa Ana River.

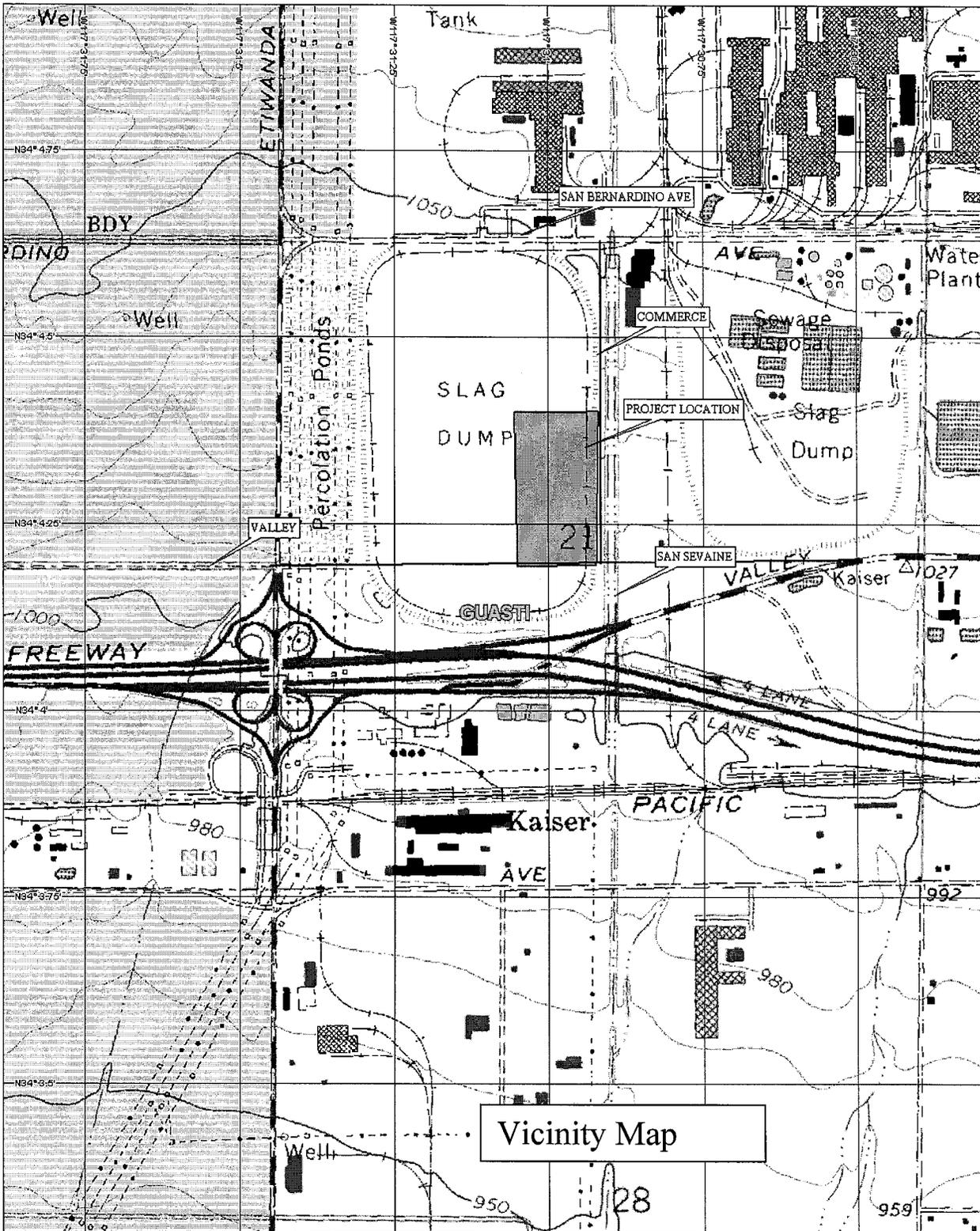
Drainage from this immediate site is covered by San Bernardino County Flood Control District.

#### **1.4.2 Pre-Existing Water Quality Problems**

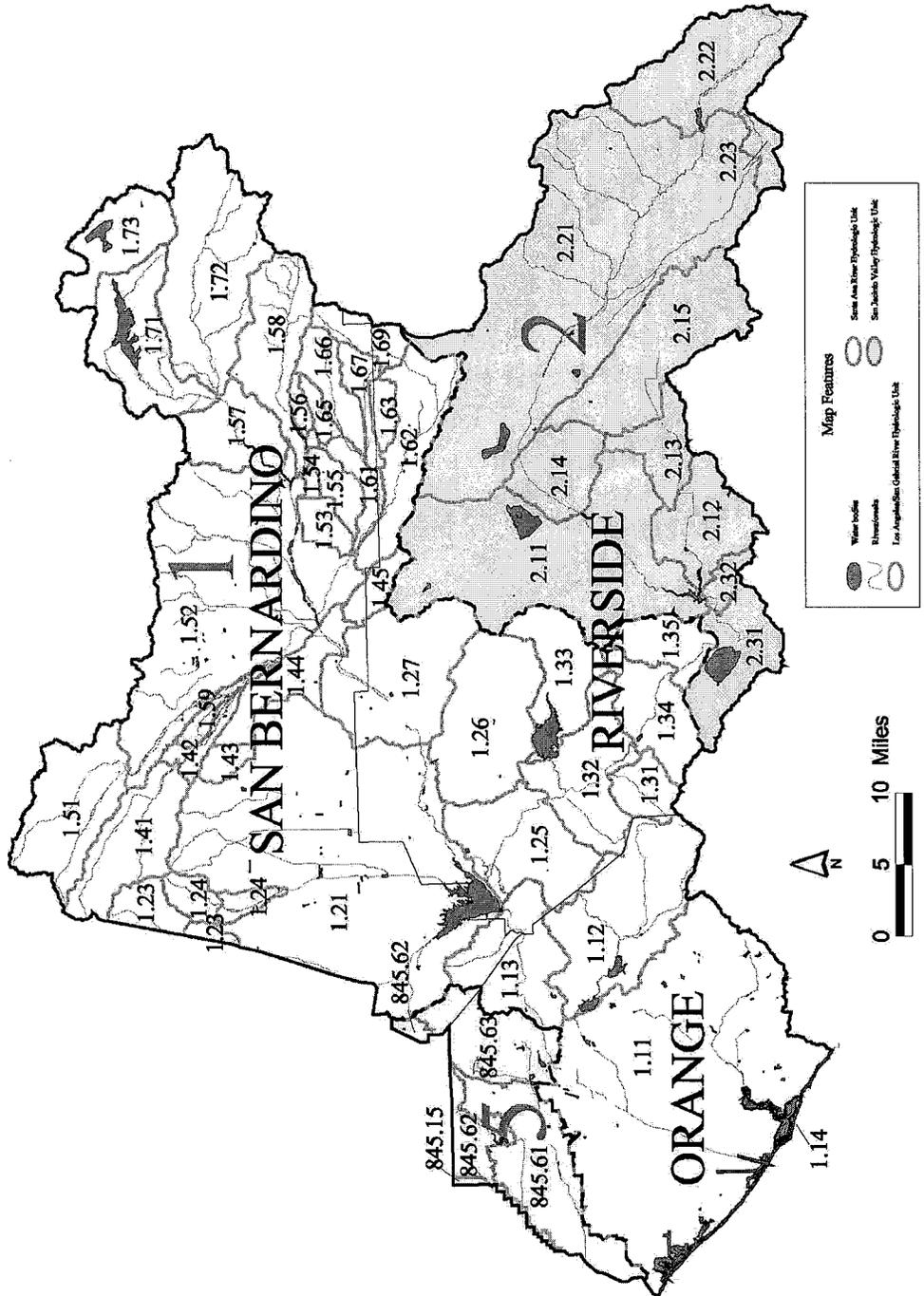
There are no noted pre-existing water quality problems noted for the site.



Area denoted as detention basin is subject site

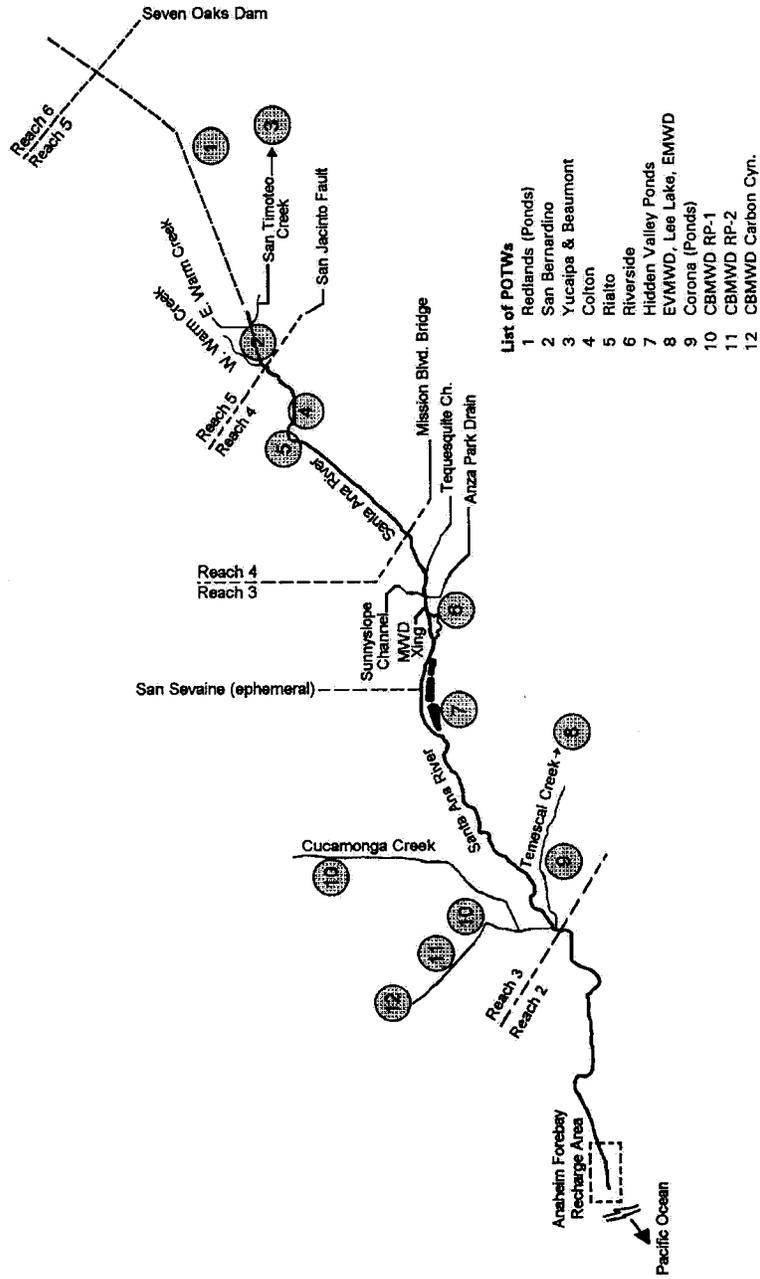


3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 350 ft Scale: 1: 12,800 Detail: 14-0 Datum: WG84



See Appendix F for hydrologic units

FIGURE 1-2  
 SANTA ANA RIVER AND TRIBUTARIES



January 24, 1995

1-7

INTRODUCTION



## Section 2 – Pollutants of Concern and Hydrologic Conditions of Concern

### 2.1 Pollutants of Concern

#### 2.1.1 All expected and potential pollutants:

Pollutant of Concern Summary Table

Pollutant Type	Expected	Potential	Listed for Receiving Water
Bacteria/Virus (Pathogens)		✓	NO
Heavy Metals	✓		NO
Nutrients		✓	NO
Pesticides		✓	NO
Organic Compounds		✓	NO
Sediments		✓	NO
Trash & Debris	✓		NO
Oxygen Demanding Substances		✓	NO
Oil & Grease	✓		NO
Other—specify pollutant(s):		✓	NO

**2.1.2 Any other pollutants of concern from the project site not listed in table:**  
Identify pollutants of concern in the Santa Ana River receiving waters as follows:

<b>Discharge Points</b>	<b>Receiving Waters</b>	<b>303(d) Water Body Y/N?</b>	<b>Beneficial Uses</b>	<b>Pollutants Impairing Water Body</b>	<b>Expected/Potential Pollutants from Site</b>	<b>Pollutants of Concern</b>
San Sevaine Channel	Proximate	N	Not Listed	None	Heavy Metals, Trash & Debris, Oil & Grease	None
Santa Ana River – Reach 3 – Prado Dam to Mission Blvd. In Riverside Primary: 801.21 Secondary: 801.27, 801.25	Downstream	N	AGR, GWR, REC1, REC2, WARM, WILD, RARE	None	See above	None Delisted for 2006
Prado Basin (Prado Basin Management Zone) Primary: 802.21	Downstream	N	REC1, REC2, WARM, WILD, RARE	None	See above	None
Santa Ana River – Reach 2 – 17 <sup>th</sup> Street in Santa Ana to Prado Dam Primary: 801.11 Secondary: 801.12	Downstream	N	MUN,AGR, GWR, REC1, REC2, WARM, WILD, RARE	None	See above	None
Santa Ana River – Reach 1 – Tidal Prism to 17 <sup>th</sup> Street in Santa Ana Primary: 801.11	Downstream	N	REC1, REC2, WARM, WILD, MUN	None	See above	None

## 2.2 Hydrologic Conditions of Concern

All Category projects must identify any hydrologic condition of concern (HCOC) that will be caused by the project, and implement Site Design, Source Control, and/or Treatment Control BMPs to address identified impacts.

<p><b>1.</b> (from Section 2.3, Part 2):</p> <p>Determine if the project will create a Hydrologic Condition of Concern. Check “yes” or “no” as applicable and proceed to the appropriate section as outlined below.</p>	<b>Yes</b>	<b>No</b>
<p><b>A.</b> All downstream conveyance channels, that will receive runoff from the project, are engineered, hardened (concrete, riprap or other), and regularly maintained to ensure design flow capacity, and no sensitive stream habitat areas will be affected. Engineered, hardened, and maintained channels include channel reaches that have been fully and properly approved (including CEQA review, and permitting by USACOE, RWQCB and California Dept. of Fish &amp; Game) by June 1, 2004 for construction and hardening to achieve design capacity, whether construction of the channels is complete. Discharge from the project will be in full compliance with Agency requirements for connections and discharges to the MS4, including both quality and quantity requirements, and the project will be permitted by the Agency for the connection or discharge to the MS4.</p>	✓	
<p><b>B.</b> Project runoff rates, volumes, velocities, and flow duration for the post-development condition will not exceed those of the pre-development condition for 1-year, 2-year and 5-year frequency storm events. This condition will be substantiated with hydrologic modeling methods that are acceptable to the Agency, to the U.S. Army Corps of Engineers (USACOE), and to local watershed authorities.</p>	✓	
<p><b>C.</b> Can the conditions in part A or B above be demonstrated for the project?</p>	✓	
<ul style="list-style-type: none"> <li>▪ If the answer for A, B, and/or C above is yes, then the project does not create a HCOC— in this case go to Section 3.</li> <li>▪ If the answer for C above is no, then go to section 2.3. Part 3, below.</li> </ul>		

**Table B2-2: Pre- and Post-development Hydrology Comparison Worksheet**

Return Period	Total Volume		Peak Flow		Flow Time Duration			Sediment Transport		
	Pre	Post	Pre	Post	% of Peak	Pre	Post	Pre	Post	
1-year	N/A	N/A	N/A	N/A						
2-year	N/A	N/A	N/A	N/A						
5-year	N/A	N/A	N/A	N/A						



## Section 3 – Best Management Practice Selection Process

### 3.1 Site Design BMPs

For listed Site Design BMPs, indicate in the following table whether it will be used (yes/no) and describe how used, or, if not used, provide justification/alternative. Provide detailed descriptions of planned Site Design BMPs, if applicable.

<b>1. Minimize Stormwater Runoff, Minimize Project's Impervious Footprint, and Conserve Natural Areas</b>		
Maximize the permeable area. This can be achieved in various ways, including but not limited to, increasing building density (number of stories above or below ground) and developing land use regulations seeking to limit impervious surfaces.		
Yes	No	✓
Describe actions taken or justification/alternative: <b>Hardscape (concrete products) have been minimized where possible. Drive aisles and parking areas are set to minimum dimensions needed for a typical warehouse/truck facility.</b>		
Runoff from developed areas may be reduced by using alternative materials or surfaces with a lower Coefficient of Runoff, or "C-Factor".		
Yes	No	✓
Describe actions taken or justification/alternative: <b>Grades and flowlines are designed to minimum allowable grades where possible; landscaped areas are recessed 2" at walks and curbs to allow settlement of silts, and infiltration of water prior to entering the concrete drainage systems. This will also keep irrigation waters from entering the storm drain system as often.</b>		
Conserve natural areas. This can be achieved by concentrating or clustering development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition.		
Yes	No	✓
Describe actions taken or justification/alternative: <b>No natural areas exist. Site added to this is a previously graded and vacant field with weeds.</b>		

Construct walkways, trails, patios, overflow parking lots, alleys, driveways, low-traffic streets, and other low-traffic areas with open-jointed paving materials or permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.		
Yes	No <input checked="" type="checkbox"/>	
Describe actions taken or justification/alternative:  <b>Walkways and travel ways must meet ADA requirements. The majority of the site is planned for trucking and heavy equipment. Many of the specialized materials cannot handle heavy loading and product manufacturers recommend against heavy loads. Any available land in the remainder of site is reserved for landscaping.</b>		
Construct streets, sidewalks, and parking lot aisles to the minimum widths necessary, provided that public safety and a pedestrian-friendly environment are not compromised <sup>1</sup> . Incorporate landscaped buffer areas between sidewalks and streets.		
Yes <input checked="" type="checkbox"/>	No	
Describe actions taken or justification/alternative: See table in section 4.1 for Operation and maintenance descriptions  <b>All streets, sidewalks and parking lot aisles are designed to meet minimum widths necessary.</b>		
Reduce widths of street where off-street parking is available <sup>2</sup> .		
Yes	No <input checked="" type="checkbox"/>	
Describe actions taken or justification/alternative:  <b>Applicable streets are public streets and cannot be reduced.</b>		
Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.		
Yes	No <input checked="" type="checkbox"/>	

<sup>1</sup> Sidewalk widths must still comply with Americans with Disabilities Act regulations and other life safety requirements.

<sup>2</sup> However, street widths must still comply with life safety requirements for fire and emergency vehicle access.

Describe actions taken or justification/alternative:

**Existing vegetation is solely weeds and as such is undesirable, so will not be saved. All proposed vegetation will meet County landscape requirements.**

Minimize the use of impervious surfaces such as decorative concrete, in the landscape design.

Yes	No <input checked="" type="checkbox"/>	
-----	--	--

Describe actions taken or justification/alternative:

**Landscape is proposed for all remaining surfaces on the development. Only necessary hardscape is present.**

Use natural drainage systems.

Yes	No <input checked="" type="checkbox"/>	
-----	--	--

Describe actions taken or justification/alternative:

**All drainage systems on and off of the property are man-made.  
No natural systems existing within the area**

Where soils conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration<sup>3</sup>.

Yes <input checked="" type="checkbox"/>	No	
---	----	--

Describe actions taken or justification/alternative:

See table in section 4.1 for Operation and maintenance descriptions

**This solution is an infiltration system utilizing Hancor perforated pipe in a rock base placed at the northwest corner to mitigate the equivalent runoff from this site and the SMC site. The basin is sized per the original requirements of the detention system. The remaining runoff will flow through a new storm drain to the San Sevaine Channel. This new infiltration system and new storm drain will replace the temporary retention area within the basin that is now being filled in since the restrictions on the San Sevaine Channel have been lifted. Additional Hancor system is also used for this site to collect and infiltrate the immediate site drainage.**

<sup>3</sup>However, projects must still comply with hillside grading ordinances that limit or restrict infiltration of runoff. Infiltration areas may be subject to regulation as Class V injection wells and may require a report to the USEPA. Consult the Agency for more information on use of this type of facility.

Construct onsite ponding areas, rain gardens, or retention facilities to increase opportunities for infiltration, while being cognizant of the need to prevent the development of vector breeding areas.

Yes  No

Describe actions taken or justification/alternative:

See table in section 4.1 for Operation and maintenance descriptions

**An infiltration system utilizing Hancor perforated pipe in a rock base at the northwest corner to mitigate the runoff from this site and another for the SMC site. The size of the infiltration basin for the SMC site is determined for the expansion area of SMC only. The equivalent volume of water coming off of the mainline storm drain will be captured and retained in-lieu of the water coming from this site. This site will size the infiltration system separately**

<b>2. Minimize Directly Connected Impervious Areas</b>		
Where landscaping is proposed, drain rooftops into adjacent landscaping prior to discharging to the storm drain.		
Yes	No <input checked="" type="checkbox"/>	
Describe actions taken or justification/alternative:  <b>The storm drain will be drained onto the pavement surface for investigation of flows prior to entering the private storm drain system. This will then proceed to the storm drain system prior to reaching the infiltration basin.</b>		
Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.		
Yes	No <input checked="" type="checkbox"/>	
Describe actions taken or justification/alternative:  <b>All possible areas will be drained towards landscape areas. When hardscape is adjacent to landscape areas at building foundations, caution is used by keeping runoff to a minimum to protect the foundations. (Refer to soils engineer's recommendations). All other drainage is collected in the underground detention/infiltration system.</b>		
Increase the use of vegetated drainage swales in lieu of underground piping or imperviously lined swales.		
Yes	No <input checked="" type="checkbox"/>	
Describe actions taken or justification/alternative:  <b>No available space for drainage swales remains on the site. The site will drain towards the northwestern corner, which will contain an infiltration basin utilizing Hancor LandMax Pipe. This new infiltration system will take the place of the originally designed and constructed detention basin for the SMC site and a new one will be sized for this site.</b>		
<b>Use one or more of the following:</b>		
Yes	No	Design Feature
	<input checked="" type="checkbox"/>	Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings

✓	Urban curb/swale system; street slopes to curb; periodic swale inlets drain to vegetated swale/biofilter.
✓	Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to municipal storm drain systems.
✓	Other comparable design concepts that are equally effective.
Describe actions taken or justification/alternative:	
<p>Streets are publicly owned and maintained streets. Drainage is accomplished as required and approved by the County Department of Public Works.</p> <p>On-site drainage is being handled similar to a dual drainage system by capturing the flows in catch basins and discharging to an infiltration system utilizing Hancor LandMax pipes.</p>	

<b>Use one or more of the following features for design of driveways and private residential parking areas:</b>		
Yes	No	Design Feature
	✓	<ul style="list-style-type: none"> <li>▪ Design driveways with shared access, flared (single lane at street) or wheel strips (paving only under tires); or, drain into landscaping prior to discharging to the municipal storm drain system.</li> </ul>
	✓	<ul style="list-style-type: none"> <li>▪ Uncovered temporary or guest parking on private residential lots may be paved with a permeable surface; or designed to drain into landscaping prior to discharging to the municipal storm drain system.</li> </ul>
	✓	<ul style="list-style-type: none"> <li>▪ Other comparable design concepts that are equally effective.</li> </ul>
Describe actions taken or justification/alternative:		
Common driveways are provided for the entire site.		

<b>Use one or more of the following design concepts for the design of parking areas:</b>		
<b>Yes</b>	<b>No</b>	<b>Design Feature</b>
	✓	Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.
	✓	Overflow parking (parking stalls provided in excess of the Agency's minimum parking requirements) may be constructed with permeable paving.
	✓	Other comparable design concepts that are equally effective.
Describe actions taken or justification/alternative:  Landscape is incorporated with design when possible; most landscape areas throughout the site are on the high side of the perimeters and can only drain within themselves.  No overflow parking planned for automobiles. Trucking requires load strengths beyond the limits of manufacturers' recommendations for alternative materials.		

### **3.2 Source Control BMPs**

All listed BMPs shall be implemented for the project. Where a required Source Control BMP is not applicable to the project due to project characteristics, justification and/or alternative practices for preventing pollutants are provided. In addition to the following tables, there are detailed descriptions on the implementation of planned Source Control BMPs.

Activity restrictions are listed at the end of this section with justifications for conformity. A recorded document with activity restrictions included is in Attachment A.

Source Control BMP Selection Matrix\*

Project Category	Source Control BMPs																									
	Education of Property Owners	Activity Restrictions	Spill Contingency Plan	Employee Training/Education Program	Street Sweeping Private Street and Parking Lots	Common Areas Catch Basin Inspection	Landscaping Planning (SD-10)	Hillside Landscaping	Roof Runoff Controls (SD-11)	Efficient Irrigation (SD-12)	Protect Slopes and Channels	Storm Drain Signage (SD-13)	Inlet Trash Racks	Energy Dissipaters	Trash Storage Areas (SD-32) and Litter Control	Fueling Areas (SD-30)	Air/Water Supply Area Drainage	Maintenance Bays and Docks (SD-31)	Vehicle Washing Areas (SD-33)	Outdoor Material Storage Areas (SD-34)	Outdoor Work Areas (SD-35)	Outdoor Processing Areas (SD-36)	Wash Water Controls for Food Preparation Areas	Pervious Pavement (SD-20)	Alternative Building Materials (SD-21)	
Significant Re-development																										
Home subdivisions of 10 or more units																										
Commercial/ Industrial Development >100,000 ft <sup>2</sup>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Automotive Repair Shop																										
Restaurants																										
Hillside Development >10,000 ft <sup>2</sup>																										
Development of impervious surface >2,500 ft <sup>2</sup>																										
Parking Lots >5,000 ft <sup>2</sup> of exposed storm water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

\* Provide justification of each Source Control BMP that will not be incorporated in the project WQMP, or explanation of proposed equally effective alternatives in the following table.

**Justification for Source Control BMPs Not Incorporated into the Project WQMP**

<b>Source Control BMP</b>	<b>Used in Project (yes/no)?</b>	<b>Justification/Alternative*</b>	<b>Implementation/ Operation &amp; Maintenance</b>
Education of Property Owners	Yes	Owners and tenants to be aware of their surroundings. Instructional materials and training will aid in the education process. The developer shall provide the training to the property owners	On-going and with each change of ownership or tenant. The developer shall provide the training to the property owner for the first installment. The property owner will take over and shall assign the duties to an individual or a service provider to provide on-going education services to tenants and future owners.
Activity Restrictions	Yes	Restrictions are customized for the specific use of the site. This site is a warehouse and trucking facility with light manufacturing and parking. Any other uses require modifications to the permitted use.	Activity restrictions require on-going monitoring to maintain efficiency.
Spill Contingency Plan	Yes	Spills from this site can be expected to be from typical household materials. Industrial spills are not expected. Ownership shall prepare a spill plan for the specific types of operations planned.	Shall be provided in accordance w/ Section 6.95 of the California Health and Safety Code Spills shall be mopped and collected in a mop bucket or the use of a broom with trash can. Lighter spills can be cleaned with sponge or rags. Disposal shall be per manufacturers recommendations when applicable. Dispose of mop bucket water into the sewer or a sealable canister for disposal at an approved site. When using a high pressure spray, a wet-dry vacuum shall collect the flows simultaneously, dispose of liquids accordingly.
Employee Training/Education Program	Yes	Training and Education is an ongoing process. Employees shall be kept up to date on all of the current regulations.	The property owners shall assign or appoint one responsible person or an on-going service provider to monitor and implement training. Training and education shall be provided as a part of the introduction process for new employees with refresher courses on a regularly schedule.
Street Sweeping Private Street and Parking Lots	Yes	A Vacuum sweeper is recommended. Smaller particle and materials and debris are collected from openings. Site shall be inspected monthly and the schedule shall be revised accordingly.	The site shall be vacuum swept when possible Sweeping can be done in the drive aisles occasionally. Private parking and private Streets must be vacuumed and/or swept once every 3 months
Common Areas Catch Basin Inspection	Yes	Several catch basins are being constructed on the site. Inspections provide assurances for wet season.	Inspect once per each season. Prior to the rainy season and monthly during rain season (Oct 15 – Apr 15) year in late summer or early fall. Clean as necessary
Landscape Planning (SD-10)	Yes	Landscape planning shall conform to agency requirements first	A permit issued by the County of San Bernardino for landscape and irrigation will show approved conformance with requirements. Plants and materials shall be maintained and replaced 'in-kind'. Any substitutions shall conform to the county's approved planting list.
Hillside Landscaping	No	There are no hillsides on the site; therefore hillside landscaping is not a necessary requirement.	Not applicable, as there are no hillsides.

<b>Justification for Source Control BMPs Not Incorporated into the Project WQMP</b>			
<b>Source Control BMP</b>	<b>Used in Project (yes/no)?</b>	<b>Justification/Alternative*</b>	<b>Implementation/ Operation &amp; Maintenance</b>
Roof Runoff Controls (SD-11)	No	Most roof drains empty onto the pavement with landscape areas too far away. Landscape along the perimeter of the site is too high for gravity drainage. Landscape cannot be moved near the roof drains due to site logistics for a trucking facility. The quantity of runoff from the roof to a single drain requires a surface area of 4,000 square feet to mitigate. The water will drain onto pavement, away from walkways, and towards concrete gutters in the drive lanes. This empties into an underground extended detention basin.	Roof runoff via roof drains is directed to hardened surfaces for protection. Outlet drains within 4" of grade or at ground surface. The areas beneath each roof drain shall be to a hardened surface to prevent massive erosion of the outlet. Inspect runoff regularly for pollutants and signs of equipment leaks on the roof. Clean up any debris or pollutants before they enter the storm drain system.
Efficient Irrigation (SD-12)	Yes	Irrigation requirements shall conform to the County of San Bernardino	Permit of Landscape and Irrigation plans will show conformance with County requirements. Irrigation system shall be monitored and inspected on a weekly basis for broken sprinkler heads, overspray, and runoff. Mulches shall be used wherever plausible
Protect Slopes and Channels	Yes	A slope will be maintained along the east side of the parcel and the northeast corner.	Landscape and irrigation shall be monitored and maintained for the slope. Any signs of sloughing or silting shall require immediate corrective measures.
Storm Drain Signage (SD-13)	Yes	This is a County of San Bernardino adopted standard.	Stencil surface next to all catch basins and all Storm Drain Inlets "NO DUMPING – FLOWS TO CREEK". Re-stencil once every 6 months or as necessary.
Inlet Trash Racks	Yes	A regional detention basin collects the water from all catch basins. Trash racks or inlet filters can prolong the life and reduce maintenance cost associated with the operation of the system.	Before and after each storm. Inspect monthly during the remainder of the year. Catch basin grates can appear to be a trash rack and act as one, clean debris from the catch basins as it appears. These are a part of the underground storm drain system maintenance.
Energy Dissipaters	No	There are no outlets on site; the system is entering a concrete-lined MS4.	Not applicable, as there are no outlets where energy dissipaters may be utilized.
Trash Storage Areas (SD-32) and Litter Control	Yes	Trash areas have been incorporated into the site design. All trash storage areas shall have a permanent roof constructed and shall be maintained accordingly.	With occupancy of the building and once a week at a minimum. Monitor use and add pickup times if needed. Trash compactors and trash areas shall be maintained on a regular schedule. Any trash storage shall be in a designated area provided with a roof structure and controls. Adjust the frequency of collection
Fueling Areas (SD-30)	No	To limit pollutants associated with fueling, no fueling will take place on site; all fueling will take place at an offsite facility.	Not applicable, as no fueling will take place on site.
Air/Water Supply Area Drainage	No	No air/water supply stations are proposed on site; these activities will take place at an offsite location.	Not applicable, as no air/water supply stations are proposed on site.

<b>Justification for Source Control BMPs Not Incorporated into the Project WQMP</b>			
<b>Source Control BMP</b>	<b>Used in Project (yes/no)?</b>	<b>Justification/Alternative*</b>	<b>Implementation/ Operation &amp; Maintenance</b>
Maintenance Bays and Docks (SD-31)	Yes	The building is devoted to trucks and loading docks	Maintenance begins upon occupancy. Inspect for spills and debris. Vacuum sweep the areas regularly. To remove stains, spills or leaks shall be mopped and collected in a mop bucket or the use of a broom with trash can. Lighter leaks or spills can be cleaned with sponge or rags. Disposal shall be per manufacturers recommendations when applicable. Dispose of mop bucket water into the sewer or a sealable canister for disposal at an approved site. When using a high pressure spray, a wet-dry vacuum shall collect the flows simultaneously, dispose of liquids accordingly.
Vehicle Washing Areas (SD-33)	No	To limit pollutants associated with vehicle washing, no vehicle washing will take place on site; all vehicle washing will take place at on offsite facility.	Not applicable, as no vehicle washing will take place on site.
Outdoor Material Storage Areas (SD-34)	Yes.	Temporary storage only. Documentation provided for future use only.	When temporary storage needed, storage shall be inspected regularly storage articles shall be recorded in logs.
Outdoor Work Areas (SD-35)	Yes	Added to document for standard everyday operations. No outdoor work areas are planned for normal operations. It is provided in this report for the purpose of practicality. Most businesses and operations will require the use of a temporary outdoor work area on occasions.	Anticipated use only; permits and a CUP may be necessary. Do not hose down or use water to clean outdoor work areas. Area will be swept and trash removed on a regular basis.
Outdoor Processing Areas (SD-36)	Yes	Added to the document for future operations only. No outdoor processing is planned for as of this report.	Owner to adjust the WQMP as needed for tenant use. Outdoor processing is not provided for in this report. If outdoor processing is needed, a CUP may be required before considering revision of this document.
Wash Water Controls for Food Preparation Areas	No	This is an industrial/commercial development; no restaurants are planned, therefore no food preparation areas are proposed for the site.	Not applicable, as there are no restaurants planned.
Pervious Pavement (SD-20)	No	Regional detention basin is used as an alternative. Pervious pavement has not been proven to withstand heavy traffic or to be reliable under heavy traffic conditions. The costs of providing mitigation can be placed elsewhere with better reliability.	Not applicable. Regional detention basin is used as an alternative.
Alternative Building Materials (SD-21)	No	No viable alternative materials are suited to this use as of this date.	Not applicable, as there are no viable alternative materials.
*Attach additional sheets if necessary for justification.			

### **Education of Property Owners –**

- Practical information materials shall be provided to the first residents/occupants/tenants on general good housekeeping practices that contribute to protection of storm water quality. Initially these materials shall be provided by the developer. Thereafter such materials will be available through the co-permittees' education program. Different materials for residential, office commercial, retail commercial, vehicle-related commercial, and industrial uses will be involved.
- The Owner(s) shall provide informational material addressing general good housekeeping practices for protection of storm water quality education for tenants. Such information will include, but not be limited to the attachments provided at the end of this report.
  - Training information can be obtained at <http://www.swrcb.ca.gov/stormwtr/training.html>
  - Other information for education and data can be obtained at <http://www.swrcb.ca.gov/stormwtr/links.html>
  - Best management handbooks and resources can be obtained at <http://www.casqa.org/>

### **Activity Restrictions –**

Activity restrictions for the purpose of protecting the quality of water that enters the storm drain system are discussed in the handout material initially provided by the developer. The material shall continue to be provided to each tenant by the building manager after the site is under the new ownership control. Activity restrictions are provided in **Attachment A**.

### **Spill Contingency Plan –**

Prepared by building operator for use by specified types of building or suite occupancies (County Environmental Health has provided a list to County Building Plan Check, as an example), which mandates stockpiling of cleanup materials, notification of responsible agencies, disposal of cleanup materials, documentation, etc.

### **Employee Training –**

Education program as it applies to future employees of businesses. Owner shall prepare an education program and manual specific to the occupant uses. The developer shall provide a manual for the initial business site with a commitment on behalf of the owner to prepare a final document. (See also Education of Property Owners)

### **Street Sweeping Private Streets and Parking Lots –**

On-site asphalt pavement areas shall be swept or vacuum cleaned on a regular basis to reduce the discharge of sediments and other pollutants into the storm drain system. Pavement shall be

maintained by a vacuum sweeper when available. Paved areas shall be swept twice per month and prior to each storm season, no later than October 15th.

**Common Area Catch Basin Inspection –**

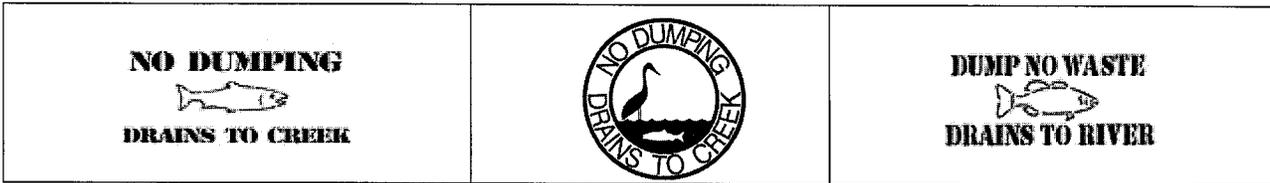
Catch basins will be inspected and cleaned as needed on a monthly basis, and more frequently during the rainy season (October 15<sup>th</sup> through April 15<sup>th</sup>).

**Efficient Irrigation (SD-12) –**

Physical implementation of landscape plan will be consistent with County Water Conservation Resolution or County equivalent, which may include provision of water sensors, programmable irrigation times (for short cycles), etc. A licensed landscape maintenance crew shall work to mitigate the amount of runoff from the landscaped areas. Specially designed controllers and heads that allow staggered start times shall be installed to control the amount of irrigation runoff into the storm drain system. Drip and irrigation bubbler heads shall be used to limit excess irrigation.

**Storm Drain Signage (SD-13) –**

Phrase “**No Dumping – Drains to River**” (or equally effective expression) to be stenciled on catch basins to alert the public to the destination of pollutants discharged into stormwater.



**Trash Storage Areas & Litter Control (SD-32)–**

Prevent waste materials from coming in direct contact with wind or rain. Cover the waste management area with a permanent roof. If this is not feasible, cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene, or hypalon. Cover dumpsters to prevent rain from washing out waste materials.

Design waste handling and disposal area to prevent stormwater run-on. Enclose the waste handling and disposal area or build a berm around it. Position roof downspouts to direct stormwater away from waste handling and disposal area.

Design waste handling and disposal area to contain spills. Place dumpsters or other waste receptacles on an impervious surface. Construct a berm or curb around the area to contain spills. Install drains connected to the public sewer or the facility’s process wastewater system within these contained areas. Do not discharge to a public sewer until contacting the local sewer authority to find out if pretreatment is required.

Keep waste collection areas clean. When cleaning around waste handling and disposal areas use dry methods when possible. If water must be used, collect water and discharge to the sewer if

permitted to do so. Do not discharge to a public sewer until contacting the local sewer authority to find out if pretreatment is required. If discharge to the sanitary sewer is not allowed, pump water to a tank and dispose of properly.

- Trash storage areas shall have a permanent roof structure.
- Secure solid waste containers when not in use.
- Regularly inspect, repair, and/or replace waste containers.
- Do not fill waste containers with washout water or any other liquid.
- Use all of a product before disposing of the container.
- Segregate wastes by type and label and date wastes.

Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements. Train employees in proper waste handling and disposal. Train employees on proper spill containment and cleanup. Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill. Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures. Establish a regular training schedule, train all new employees, and conduct annual refresher training. Use a training log or similar method to document training.

Schedule regular maintenance consisting, at a minimum, of litter control, emptying of trash receptacles, and sweeping of dumpster enclosure areas in order to reduce the likelihood of polluting storm water runoff.

**Solid Waste Storage:** all refuse generated at the premises shall at all times be stored in approved containers and shall be placed in a manner so that visual or other impacts and environmental public health nuisances are minimized and complies with County Codes.

**Garbage removal:** all refuse containing garbage shall be removed from the premises at least one time per week to an approved solid waste facility.

**Solid Waste Removal:** all refuse not containing garbage shall be removed from the premises at least one time per week to an approved solid waste facility.

#### **Alternate Building Materials –**

Coated metal products are a recommended option but not proposed. These products can eliminate contact of bare metal with rainfall, eliminating one source of metals in runoff. There are also roofing materials made of recycled rubber and plastic that resemble traditional materials. Wood siding is commonly used on the exterior of residential construction. This material weathers fairly rapidly and requires repeated painting to prevent rotting. Alternative “new” products for this application include cement-fiber and vinyl. Cement-fiber siding is a masonry product made from Portland cement, sand, and cellulose and will not burn, cup, swell, or shrink.

Activities not allowed unless permitted by the County of San Bernardino and amended herein:

- Fueling areas
- Air/water supply drainage area
- Vehicle washing areas
- Outdoor storage areas

- Outdoor processing areas
- Washwater controls for food preparation areas

### 3.3 Treatment Control BMPs

Minimizing a development's adverse effects on water quality can be most effectively achieved using a combination of Site Design, Source Control and/or Treatment Control BMPs. Where projects have been designed to eliminate or reduce the introduction of expected pollutants of concern into runoff from the project site through the implementation of Site Design and Source Control BMPs, the development may still have the potential for pollutants of concern to enter the MS4 or receiving waters. If all pollutants of concern are not adequately addressed by Site Design and Source Control BMPs, Treatment Control BMPs are required.

Where required, Treatment Control BMPs must be implemented unless equivalent treatment is provided. Treatment Control BMPs must be selected to address the identified pollutants and hydrologic conditions of concern. Treatment Control BMPs must be designed to treat the stormwater quality flow or the stormwater quality volume from a development, and must be located to treat the required runoff volume or flow prior to discharging to any receiving water.

Where approved regional or watershed management programs are available within the downstream watershed to address the pollutants of concern from new development and significant redevelopment, a project may participate in a regional- or watershed-based program. At this time, no regional- or watershed-based management programs are being proposed as part of this Model WQMP for Regional Board staff approval. Local implementation plans may include proposals for sub-regional programs for Regional Board staff approval (see Section 3, below). The regional or sub-regional plans are subject to public review and comments and may be presented to the Regional Board for consideration.

For identified pollutants of concern that are causing an impairment in receiving waters, the project WQMP shall incorporate one or more Treatment Control BMPs of medium or high effectiveness in reducing those pollutants. For more specific information on the pollutant removal capabilities of various BMPs, refer to the California Stormwater Quality Association's, "Stormwater Best Management Practices Handbook for New Development and Redevelopment" (CASQA 2003). Table 2-5 lists Treatment Control BMPs and the primary design basis (flow-based or volume-based) to be used for designing BMPs. Sections 2.5.3.1 and 2.5.3.2 (of the WQMP Guide) provide detailed guidance for determining the flow or volume of runoff from a project to be treated via Treatment Control BMPs.

The obligation to install treatment control BMPs at new development and redevelopment sites is met if, for a common scheme of development, BMPs are constructed with the requisite capacity to serve the entire common scheme, even if certain phases of the common scheme may not have BMP capacity located on that phase. BMP capacity must be functional before any phased work begins, thus may not be added on at the end of phased development.

## **Project-Specific Treatment Controls**

### **BASIN REPLACEMENT DESCRIPTION**

The existing basin will no longer be used to mitigate water from the SMC Building Expansion site. The existing detention basin on the site is to be filled in and an infiltration trench system utilizing Hancor perforated pipe in a class 1 rock base will be installed within the northwest corner of the site which formerly held the detention basin. The new underground infiltration system is designed to meet the treatment standards and sizes equivalent to the previously used detention basin.

The flows tributary to the infiltration system will not be all from the SMC site but they will be an equivalent amount of the drainage from the SMC Building Expansion Site that will still flow by storm drain to the northeastern corner of the remote site at Commerce Dr. and Valley Blvd. Drainage for SMC will be mitigated by using the new infiltration system for the equivalent amount of water.

Once into the new infiltration system, the flows will be inseparable with the flows from adjacent projects. The flows will, in a sense, become mixed with all of the flows from other projects within the watershed. To compensate for the project's new increase in runoff volume, the infiltration basin will be equipped with a retention area equivalent to the volume that would run from SMC. When the flows become more predominate, the depth of water will stop the inflow of water to the infiltration area causing the water to bypass the system until water is allowed to flow into the MS4 facilities. Once the water has percolated, additional flows can be accepted by the system.

This remaining flow is to be transported by the new storm drain pipe along the eastern side of the Commerce Dr. /Valley Blvd. site. This storm drain will then empty to the San Sevaine Channel.

The cost of constructing the new system will be borne by this project while the cost of the maintenance for the system will be the responsibility of the SMC site owners. An easement for access will be provided to the SMC site owners for this purpose.

For sizing of the system refer to the drainage calculations included with this report and the approved plans for this site.

For Implementation see table in section 4.1 of this report

For Operation and maintenance of the Hancor system see table in section 4.1 of this report.

For long term inspection, operation and management see section 4.1.3 for the responsible persons.

See attachment D for volume calculations

Pollutant of Concern	Treatment Control BMP Categories									
	Biofilters	Detention Basins (2)	Infiltration Basins (3)	Wet Ponds or Wetlands	Filtration	Water Quality Inlets	Hydrodynamic Separator Systems (4)	Manufactured/ Proprietary Devices		
<b>Sediment/Turbidity</b>	H/M	M	H/M	H/M	H/M	L	H/M (L for turbidity)	U		
Yes/No?	-	P	P	-	-	-	-	-		
<b>Nutrients</b>	L	M	H/M	H/M	L/M	L	L	U		
Yes/No?	-	P	P	-	-	-	-	-		
<b>Organic Compounds</b>	U	U	U	U	H/M	L	L	U		
Yes/No?	-	P	P	-	-	-	-	-		
<b>Trash &amp; Debris</b>	L	M	U	U	H/M	M	H/M	U		
Yes/No?	-	E	E	-	-	-	-	-		
<b>Oxygen Demanding</b>	L	M	H/M	H/M	H/M	L	L	U		
Yes/No?	-	P	P	-	-	-	-	-		
<b>Bacteria &amp; Viruses</b>	U	U	H/M	U	H/M	L	L	U		
Yes/No?	-	P	P	-	-	-	-	-		
<b>Oils &amp; Grease</b>	H/M	M	U	U	H/M	M	L/M	U		
Yes/No?	-	E	E	-	-	-	-	-		
<b>Pesticides (non-soil bound)</b>	U	U	U	U	U	L	L	U		
Yes/No?	-	P	P	-	-	-	-	-		
<b>Metals</b>	H/M	M	H	H	H	L	L	U		
Yes/No?	-	E	E	-	-	-	-	-		

E= expected from site P= potential

<p>(1) Cooperative periodic performance assessment may be necessary. This Treatment Control BMP table will be updated as needed and as knowledge of stormwater treatment BMPs improves.</p> <p>(2) For detention basins with minimum 36-48-hour drawdown time.</p> <p>(3) Including trenches and porous pavement.</p> <p>(4) Also known as hydrodynamic devices and baffle boxes.</p>	<p>L: Low removal efficiency; H/M: High or medium removal efficiency;</p> <p>U: Unknown removal efficiency</p> <p>Sources: Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993), National Stormwater Best Management Practices Database (2001), and Guide for BMP Selection in Urban Developed Areas (2001), California Stormwater BMP Handbook—New Development and Redevelopment (2003).</p>
<p>Biofilters include:</p> <ul style="list-style-type: none"> <li>▪ Grass swales</li> <li>▪ Grass strips</li> <li>▪ Wetland vegetation swales</li> <li>▪ Bioretention</li> </ul> <p>Detention Basins include:</p> <ul style="list-style-type: none"> <li>▪ Extended/dry detention basins with grass lining</li> <li>▪ Extended/dry detention basins with impervious lining</li> </ul> <p>Infiltration Basins include:</p> <ul style="list-style-type: none"> <li>▪ Infiltration basins</li> <li>▪ Infiltration trenches</li> </ul> <p>Wet Ponds and Wetlands include:</p> <ul style="list-style-type: none"> <li>▪ Wet ponds (permanent pool)</li> <li>▪ Constructed wetlands</li> </ul>	<p>Filtration Systems include:</p> <ul style="list-style-type: none"> <li>▪ Media filtration</li> <li>▪ Sand filtration</li> </ul> <p>Water Quality Inlets include:</p> <ul style="list-style-type: none"> <li>▪ Trapping catch basins</li> <li>▪ Oil water separators</li> </ul> <p>Hydrodynamic Separation Systems Include</p> <ul style="list-style-type: none"> <li>▪ Swirl Concentrators</li> <li>▪ Cyclone Separators</li> </ul> <p>Manufactured/Proprietary Devices include:</p> <ul style="list-style-type: none"> <li>▪ Other proprietary stormwater treatment devices as listed in the CASQA BMP Handbook</li> <li>▪ Effective stormwater BMPs not specifically listed in this WQMP and/or newly developed treatment devices—treatment efficiencies are unknown but must be determined if proposed in the WQMP</li> </ul>

### 3.4 BMP Design Criteria

- The following Treatment Control BMP(s) (Flow Based) will be implemented for this project (*check “Implemented” box, if used*):

*Design Basis of Treatment Control BMPs*

Implemented	Treatment Control BMP	Design Basis
	Vegetated Buffer Strips	Flow Based
	Vegetated Swale	
	Multiple Systems	
	Manufactured/Proprietary	
	Bioretention	Volume Based
	Wet Pond	
	Constructed Wetland	
✓	Extended Detention Basin	
	Water Quality Inlet	
	Retention/Irrigation	
✓	Infiltration Basin	
	Infiltration Trench	
	Media Filter	
✓	Manufactured/Proprietary	

**Trash and Debris** – larger trash and debris larger than ¾ inches will collect prior to entering the catch basins. Small debris that may enter the drainage will drain into a pipe wrapped specifically for collection. Any flows into this pipe will be filtered (trapping debris and trash) before exiting.

**Oil and Grease** – None woven filter has some ability to collect and filter oils and grease, especially in larger quantities. Detention basins have an additional ability to collect oils and grease, according to the charts, a medium range or level ability. All water for a 1-year and a 2-year storm will not leave the site and only 10% of the 5-year storm will be expected to leave the site. Oil and grease typically predominate in the lesser storms of 3- to 6-month intensities.

**Metals**- Detention systems and Infiltration systems as used with this project have a medium to high range ability for mitigation.

### 3.5 Flow-Based Design Criteria (not used for this project)

Flow-based BMP design standards apply to BMPs whose primary mode of pollutant removal depends on the rate of flow of runoff through the BMP. The Permit specifies sizing criteria that must be used to design structural BMPs for a project.

Please find the materials enclosed in this section that provide the following required information:

1. Identification of the drainage area that drains to the proposed BMP. This includes all areas that will contribute runoff to the proposed BMP, including pervious areas, impervious areas, and runoff from off-site areas that commingle with site runoff, whether or not they are directly or indirectly connected to the BMP. The area has been calculated in acres.

*Please see the attached Site Plan (Section 3.5.1)*

2. The rainfall intensity criteria has been determined using the appropriate 'Cumulative Frequency - One Hour Average Intensity - 24 Hour Rainfall' Curve. The rainfall intensity corresponding to the cumulative probability specified in the Permit (85%) was used. Using the curve, the rainfall intensity corresponding to the 85% percentile was determined. The intensity was multiplied by the safety factor specified in the criteria, (usually 2), to calculate the "Design Rainfall Intensity."

*Please see the attached calculations (Section 3.5.2)*

3. The composite runoff coefficient "C-Factor" for the BMP Drainage Area has been calculated. Composite the individual C-Factors using area-weighted averages.

*Please see the attached calculations (Section 3.5.2)*

4. The BMP design flow was calculated by using the Rational Formula ( $Q = CiA$ ). Using the BMP Drainage Area, the Design Rainfall Intensity, and the composite runoff coefficient (C-Factor), the Rational Formula (see Table 2-5 below for use limitations for the Rational Formula) was applied. The result is the BMP Design Flow.

$Q = CiA$ , where:

$Q =$  BMP Design Flow (ft<sup>3</sup>/s)

$i =$  Rainfall Intensity (in/hr)

$A =$  BMP Drainage Area (Acres)

$C =$  C-Factor (runoff coefficient)

*Please see the attached Site Plan (Section 3.5.1)*

**From Table 2-5**

**Use of Rational Formula for Stormwater BMP Design (CASQA 2003)**

BMP Drainage Area (Acres)	Composite Runoff Coefficient, "C"			
	0.00 to 0.25	0.26 to 0.50	0.51 to 0.75	0.76 to 1.00
0 to 25	Caution	Yes	Yes	Yes
26 to 50	High Caution	Caution	Yes	Yes
51 to 75	Not Recommended	High Caution	Caution	Yes
76 to 100	Not Recommended	High Caution	Caution	Yes

**3.5.1 Flow Design Criteria Site Plan Exhibit (for expansion area).**

- 1 Identify the “BMP Drainage Area”: **Overall Drainage Area = 9.05 Acres**
- 2 Outline the Drainage Area on the NOAA Atlas 14 Precipitation Depths (2-year 1-hour Rainfall) Map (Figure D-1): **See Following Page**
- 3 Determine the area-averaged 2-year 1-hour rainfall value for the Drainage Area outline above. **0.58**

**A. Flow-Based BMP Design**

1. Calculate the composite runoff coefficient,  $C_{BMP}$ , as defined in Table B-2, below. **0.83**
2. Determine which Region the BMP Drainage Area is located in (Valley, Mountain, or Desert). **VALLEY**
3. Determine BMP design rainfall intensity,  $I_{BMP}$ , by multiplying the area-averaged 2-year 1-hour value from the NOAA Atlas 14 map by the appropriate regression coefficient from Table D-1 (“I”), and then multiplying by the safety factor specified in the criteria – usually a factor of 2.  **$0.58 * 0.2787 * 2 = 0.32$**
4. Calculate the target BMP flow rate,  $Q$ , by using the following formula (see Table D-2 below for limitations on the use of this formula):

$$Q = C_{BMP} * I_{BMP} * A$$

$$Q = 0.83 * 0.32 * 9.05 = 2.40$$

where:  $Q$  = flow in  $ft^3/s$

$I_{BMP}$  = BMP design rainfall intensity, in inches/hour

$A$  = Drainage Area in acres

$C_{BMP}$  = composite runoff coefficient

**Table D-1: Regression Coefficients for Intensity (I) and 6-hour mean storm rainfall ( $P_6$ ).**

Quantity	Valley 85% upper confidence limit	Mountain 85% upper confidence limit	Desert 85% upper confidence limit
I	0.2787	0.3614	0.3250
$P_6$	1.4807	1.9090	1.2371

**Table D-2:** Use of the flow-based formula for BMP Design (CASQA 2003).

BMP Drainage Area (Acres)	Composite Runoff Coefficient, "C"			
	0.00 to 0.25	0.26 to 0.50	0.51 to 0.75	0.76 to 1.00
0 to 25	Caution	Yes	Yes	Yes
26 to 50	High Caution	Caution	Yes	Yes
51 to 75	Not Recommended	High Caution	Caution	Yes
76 to 100	Not Recommended	High Caution	Caution	Yes

If the flow-based BMP formula use case, as determined by Table D-2, shows "Caution," "High Caution," or "Not Recommended," considering the project's characteristics, then the project proponent must calculate the BMP design flow using the unit hydrograph method, as specified in the most current version of the San Bernardino County Hydrology Manual, using the design storm pattern with rainfall return frequency such that the peak one hour rainfall depth equals the 85th-percentile 1-hour rainfall multiplied by two.

3.5.2 Flow Design Criteria Calculations (for expansion area).

B. Volume-Based BMP Design (used for this design)

- 1) Calculate the “Watershed Imperviousness Ratio”,  $i$ , which is equal to the percent of impervious area in the BMP Drainage Area divided by 100.
- 2) Calculate the composite runoff coefficient  $C_{BMP}$  for the Drainage Area above using the following equation:

$$C_{BMP} = 0.858 * 0.90^3 - 0.78 * 0.90^2 + 0.774 * 0.90 + 0.04$$
$$C_{BMP} = (0.858 * 0.729) - (0.78 * 0.81) + (0.774 * 0.90) + 0.04 = 0.73$$

where:  $C_{BMP}$  = composite runoff coefficient; and, **0.73**  
 $i$  = watershed imperviousness ratio. **0.90**

1. Determine which Region the Drainage Area is located in (Valley, Mountain or Desert). **VALLEY**
2. Determine the area-averaged “6-hour Mean Storm Rainfall”,  $P_6$ , for the Drainage Area. This is calculated by multiplying the area averaged 2-year 1-hour value by the appropriate regression coefficient from Table D-1.  **$0.58 * 1.4807 = 0.86$**
3. Determine the appropriate drawdown time. Use the regression constant  $a = 1.582$  for 24 hours and  $a = 1.963$  for 48 hours. *Note: Regression constants are provided for both 24 hour and 48 hour drawdown times; however, 48 hour drawdown times should be used in most areas of California. Drawdown times in excess of 48 hours should be used with caution as vector breeding can be a problem after water has stood in excess of 72 hours. (Use of the 24 hour drawdown time should be limited to drainage areas with coarse soils that readily settle and to watersheds where warming may be detrimental to downstream fisheries.)*  **$a = 1.963$**
4. Calculate the “Maximized Detention Volume”,  $P_0$ , using the following equation:

$$P_0 = a \cdot C_{BMP} \cdot P_6$$
$$P_0 = 1.963 * 0.73 * 0.86 = 1.23$$

where:  $P_0$  = Maximized Detention Volume, in inches  
 $a = 1.582$  for 24 hour and  $a = 1.963$  for 48 hour drawdown,  
 $C_{BMP}$  = composite runoff coefficient; and,  
 $P_6$  = 6-hour Mean Storm Rainfall, in inches

5. Calculate the “Target Capture Volume”,  $V_0$ , using the following equation:

$$V_0 = (P_0 \cdot A) / 12$$
$$V_0 = (1.23 * 9.05) / 12 = 0.93$$

where:  
 $V_0$  = Target Capture Volume, in acre-feet  
 $P_0$  = Maximized Detention Volume, in inches; and,  
 $A$  = BMP Drainage Area, in acres

**Table B-2  
C Values Based on Impervious/Pervious Area Ratios**

% Impervious	% Pervious	C
0	100	0.15
5	95	0.19
10	90	0.23
15	85	0.26
20	80	0.30
25	75	0.34
30	70	0.38
35	65	0.41
40	60	0.45
45	55	0.49
50	50	0.53
55	45	0.56
60	40	0.60
65	35	0.64
70	30	0.68
75	25	0.71
80	20	0.75
85	15	0.79
90	10	0.83
95	5	0.86
100	0	0.90

**NOTE:**

Obtain individual runoff coefficient C-Factors from the local agency or from the local flood control district.

If C-Factors are not available locally, obtain factors from hydrology text books or estimate using this table.

Composite the individual C-Factors using area-weighted averages to calculate the Composite C Factor for the area draining to a treatment control BMP.

Do not use the C-Factors in this table for flood control design or related work.

### Basin Volume Calculations (this site)

Volume of water that needs to be retained = 0.93 ac-ft.

0.93 ac-ft = 40,511 cu-ft = 303,022 gals

Note: The retention basin is designed to be used as a treatment facility. This is to verify the minimum volume required to mitigate total volume outflow from the current site.

The system is designed with one 60" diameter Hancor HDPE pipe with rock. See the pipe details for more information.

To determine the length of detention storage area needed, we will determine the volume of water per foot of pipe.

### Area calculation

Area for three 60" diameter pipe.

$$\text{Area} = \pi r^2$$

$$\text{Area} = 3.14(6.25\text{sf}) * 3 = 58.87\text{sf}$$

One foot of three 60" pipe in system will hold 58.87 cu-ft of water

Area of rock surrounding the pipe.

$$7.0 \text{ ft times } 26.0 \text{ ft} = 182\text{sf}$$

182 sf minus the area of the three pipes

the outside diameter of the pipe is approximately 6 feet

$$\text{Area} = \pi r^2$$

$$\text{Area} = 3.14(9.00\text{sf}) * 3 = 84.78\text{sf}$$

$$\text{Area of rock} = 182\text{sf} - 84.78\text{sf} = 97.22\text{sf}$$

One foot of system has 97.22 cu-ft of rock

Only 40 percent of the rock can be used for water storage

$$97.22 \text{ cu-ft } (0.4) = 38.9 \text{ cu-ft of water.}$$

### Volume

Total available volume of pipe and voids is 38.9 cf (voids in rock) + 58.87 cf (pipe) = 97.77 cf

This site needs 40,511 cf of storage for  $V_m = 414 \text{ ft of pipe needed} + 10\% \text{ safety factor} = 456$

$l_f = \text{length of system needed.}$

**Actual length of system used = 500**

The soils engineer recommends a factored hydraulic conductivity value of 2 inches/hour (30 gallons/sf/day) to be used for design of the basin.

303,022 gallons / 30 gallons per sf for 48 hours = 10,100 sf minimum basin bottom.

Actual basin bottom used = 13,000 sf

Minimum volume of basin needed = 40,511 cu-ft

Actual volume of basin used = 48,885 cu-ft



## Section 4 - Operation and Maintenance

Identification of each BMP that requires Operation and Maintenance.

### 4.1.1 Operation and Maintenance Description and Schedule:

<b>BMP</b>	<b>Operation &amp; Maintenance</b>	<b>Start Date</b>	<b>Scheduled Inspection</b>
<b>Education of Property Owners</b>	Provide informational material addressing general good housekeeping practices for protection of storm water quality education of property tenants. Activity restrictions for the purpose of protecting the quality of water that enters the storm drain system should be discussed in the handout material that is to be provided to each tenant.	Starts with Owner or tenant occupancy.	Upon occupancy and with new employees or tenants. Continuous monitoring and training required with regularly scheduled refresher sessions.
<b>Activity Restrictions</b>	Provide a list of restrictions applicable to the operation for the development. Assign management and inspection activities to responsible persons, or alternatively, the building operator may assign a manager/inspector for enforcement. Leases and Purchases shall include wording that defines use restrictions.	Starts with Owner or tenant occupancy.	Continuous. Restrictions shall be made available upon occupancy or beginning of employment. Handouts shall be sent out annually for all tenants and employees.
<b>Spill Contingency Plan</b>	Spills shall be mopped and collected in a mop bucket or the use of a broom with trash can. Lighter spills can be cleaned with sponge or rags. Disposal shall be per manufacturers (MSDS) recommendations when applicable. Dispose of mop bucket water into the sewer or a sealable canister for disposal at an approved site. A high pressure spray is recommended for final clean up. Use a wet/dry vacuum in conjunction with the sprayer to collect water before it runs off the surface area. Protect the work area to avoid overspray.	Starts with Owner or tenant occupancy	Site shall be inspected daily for spills. All personnel shall be instructed on how to handle wet and dry spills. Protection shall be provided in accordance w/ Section 6.95 of the California Health and Safety Code.
<b>Employee Training/ Education Program</b>	Provide ongoing training for property management personnel by providing seminar training. Verify that the management personnel responsible for storm water management have the proper training prior to project commencing. Keep a list of trained and responsible personnel available on the site.	Upon occupancy and/or employment.	Continuously. Annual refresher training shall be provided.
<b>Street Sweeping Private Street and Parking Lots</b>	Use of a Vacuum sweeper is recommended. Paved areas shall be swept clean on a regular basis to reduce the discharge of sediments and other pollutants into the storm drain system from paved surfaces. Remove soil, organic material, dust, trash and other debris to keep paved surfaces clean and remove sediment from the roadways and lots before it enters the storm drain systems. The removal of dust also reduces airborne pollution and sediment loading. Larger debris may require collecting manually prior to sweeping.	Construction Permit issuance  Regular schedule of sweeping shall start as a condition of certificate of occupancy.	Minimum twice per month and prior to each storm season no later than October 15 <sup>th</sup> .
<b>Catch Basin</b>	Typical maintenance of catch basins includes	At completion of	Catch basins shall be inspected

<b>BMP</b>	<b>Operation &amp; Maintenance</b>	<b>Start Date</b>	<b>Scheduled Inspection</b>
<b>Inspections</b>	trash removal if a screen or other debris capturing device is used, and removal of sediment using a vacuum or vactor tank truck. Operators need to be properly trained in catch basin maintenance. Maintenance shall include keeping a log of the amount of sediment collected and the date of removal.	storm drain system and prior to Precise Grading Certification.	and cleaned as needed on a monthly basis, and more frequently during the rainy season (October 15 <sup>th</sup> through April 15 <sup>th</sup> ).
<b>Landscape Planning (SD-10)</b>	Landscaped areas adjacent to parking lots and walkways shall be set below the adjacent grades to allow time for water and silt to settle. Walkways shall drain into landscape areas when possible. Keep the soils at edges of planters lower than the paved surfaces. Use flatter grades to allow time for water to settle. Areas utilizing mulches require care to eliminate polluting the storm drains with loose mulch.	Precise grading certification and occupancies.	Inspect before and after rains. Remove silt from low spots to allow new ponding to occur. Re-inspect after new landscaping is installed or revised.
<b>Efficient Irrigation (SD-12)</b>	Irrigation timers with short durations shall be utilized. Set timers by visual comparison of water runoff. If more water is needed for the plants, add more cycles during the day. Set times specific to each area being irrigated. Reduce times during wetter periods and utilize an automatic rain-triggered shutoff switch.	Precise Grading Certification and occupancies.	Inspect weekly for signs of irrigation water running onto pavements.
<b>Storm Drain Signage (SD-13)</b>	Legibility of markers and signs should be maintained as the signage on top of the curbs tends to weather and fade. Furthermore, the signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.	During initial parking lot markings and striping	Re-stencil with non-polluting water-based paints every 6 months and as necessary.
<b>Inlet Trash Racks</b>	Cover all storm drain inlets with a grate or rack to collect larger debris. Keep size of grating at less than one inch when possible. Catch basin inserts can be used when they do not block the flows of storm water. Check with the manufacturers' brochures.	Precise grading certification	Inspect and collect debris at a regular landscape maintenance schedule. Check before and after rains.
<b>Alternative Building Materials (SD-21)</b>	Use and maintain materials that limit storm water pollution. Items such as pressure-treated woods that contain large amounts of arsenic, for instance. Use alternatives that will not bleed pollutants into storm drain system. Maintain those that do by covering or coating with non-polluting materials. Monitor all materials for peeling and for those in need of maintenance, replace with alternative solutions when possible. Use environmentally- friendly paints and solvents.	Construction	Monitor materials during construction and evaluate possibilities of replacing with alternatives. Minimize use of additives.
<b>Trash Storage Areas (SD-32)</b>	The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator.	Certificate of Occupancy	Twice per month.
<b>Litter Control</b>	Collection of trash on grounds, and sweeping of enclosed dumpster areas.		On a weekly basis.
<b>Maintenance Bays and Docks (SD-31)</b>	Keep surfaces clean regularly. Inspect the nearby catch basins for debris. Keep areas clean by checking for spills and debris before they enter the storm drain.	Precise Grading Certification	Weekly. Also, before and after each rain.

<b>BMP</b>	<b>Operation &amp; Maintenance</b>	<b>Start Date</b>	<b>Scheduled Inspection</b>
<b>Outdoor Material Storage Areas (SD-34)</b>	Not an expected use. Materials are provided within the report to describe to the Owner(s) the requirements of creating an outdoor storage area.	Approval of CUP and/ or other agency-required clearances.	Not to be used with this project. Reference only.
<b>Outdoor Work Areas (SD-35)</b>	Not an expected use. Materials are provided within the report to describe to the Owner(s) the requirements of creating an outdoor work area.	Approval of CUP and/ or other agency-required clearances.	Not to be used with this project. Reference only.
<b>Manufactured Proprietary Devices</b>	Kristar Flo-gard catch basin filters are to be used in the expansion area basins. Filters are to be used for capture of trash and debris. Some oils and greases will be collected with this system.	Prior to occupancy	Inspect the catch basin filters quarterly and after each storm event.
<b>Manufactured Proprietary Devices</b>  <b>Hancor Perforated HDPE Pipe</b>	<p>The Hancor perforated pipe uses the standard Hancor HDPE pipe drilled at the factory to engineered specifications for size and number of drainage holes. The pipe is installed underground in the same location and to the same requirements as regular HDPE pipe. Riser clean-outs are present with manholes at various locations for access.</p> <p>The perforated pipe has the openings on the bottom portion of the pipe for a “down-flow” into the rock detention basin.</p> <p>The 10-inch riser can be used as an observation well and for access of a Vacuum Truck that can be used to remove sediment.</p>	Prior to occupancy	Inspect through the risers quarterly and after each storm event. A log book shall be maintained showing the depth of water in the pipe at each observation location to determine the rate at which the system dewateres after runoff producing storm events. Once the performance characteristics of the pipe have been verified, the monitoring schedule can be reduced to an annual basis, unless the performance data suggests that a more frequent schedule is required. Sediment should be removed when deposits approach within six inches of the invert heights.

1. Self-inspections and recordkeeping requirements for BMPs including identification of responsible parties for inspection and recordkeeping.
2. Signed statement (with date) accepting responsibility for maintenance, repair, replacement, and inspection of BMPs.
3. Operation & Maintenance requirements must be transferred to future site owners.

#### 4.1.2 Inspection & Monitoring requirements:

Users subject to the reporting requirements of this chapter shall retain, and make available for inspection and copying, all records of information obtained pursuant to any monitoring activities required by this chapter, and any additional records of information obtained pursuant to monitoring activities undertaken by the user independent of such requirements. Records shall include the date, exact place, method, and time of sampling, and the name of the person(s) taking the samples; the dates analyses were performed; who performed the analyses; the analytical techniques or methods used; and the results of such analyses. These records shall remain available for a period of at least three years. This period shall be automatically extended for the duration of any litigation concerning the user or the Agency, or where the user has been specifically notified of a longer retention period by the Agency.

#### 4.1.3 Identification of Responsible Party for Operation and Maintenance:

The following identifies the responsible party for the ongoing post-construction operation and maintenance of the applicable BMP's:

**Prologis Logistics Services Inc.** will be involved in the short-term and long-term funding of the project.

Address:

2817 E. Cedar Avenue, Suite 200  
Ontario, CA 91761

Phone Number: 909-673-8700

Prologis will be responsible for the continuous implementation of the BMP Operation & Maintenance guidelines laid forth in this WQMP.



## Section 5 - Funding

### 5.1 Funding

The Permit requires that for all Treatment Control BMPs, a funding source or sources for operation and maintenance of each BMP be identified within the WQMP.

**Prologis Logistics Services Inc.** will be involved in the short-term and long-term funding of the project.

Address:  
2817 E. Cedar Avenue, Suite 200  
Ontario, CA 91761

Phone Number: 909-673-8700



## Section 6 - WQMP Certification

### 6.1 Certification

- The applicant is required to sign and certify that the WQMP is in conformance with Santa Ana Regional Water Quality Control Board Order Number R8-2002-0012 (NPDES Permit No. CAS618036).
- The applicant is required to sign and date the following statement ‘word-for-word’ certifying that the provisions of the WQMP have been accepted by the applicant and that the applicant will have the plan transferred to future successors (transferability statement). The certification must be signed by the property owner, unless a written designation by the owner allows a designee to sign on the owner’s behalf.

“This Water Quality Management Plan has been prepared for **Prologis Logistics Services Inc.**, by **Danjon Engineering, Inc.** It is intended to comply with the requirements of the County of San Bernardino for Project Number P200600452/CUP Public Works Department Condition Number 44 requiring the preparation of a Water Quality Management Plan (WQMP). The undersigned is aware that Best Management Practices (BMPs) are enforceable pursuant to the County’s Water Quality Ordinance. The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with San Bernardino County’s Municipal Stormwater Management Program and the intent of the NPDES Permit for San Bernardino County and the incorporated cities of San Bernardino County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors in interest and the County/county shall be notified of the transfer. The new owner will be informed of its responsibility under this WQMP. A copy of the approved WQMP shall be available on the subject site in perpetuity. “

“I certify under a penalty of law that the provisions (implementation, operation, maintenance, and funding) of the WQMP have been accepted and that the plan will be transferred to future successors.”

\_\_\_\_\_  
Applicant’s Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Applicant’s Name

\_\_\_\_\_  
Applicant’s Telephone Number

\_\_\_\_\_  
Co-Applicant’s Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Co-Applicant’s Name

\_\_\_\_\_  
Applicant’s Telephone Number



# Attachment A

## Maintenance Mechanisms

### Attachment A-1

**A-1.1** The Agency shall not accept stormwater structural BMPs as meeting the WQMP requirements standard, unless an O&M Plan is prepared and a mechanism is in place that will ensure ongoing long-term maintenance of all structural and non-structural BMPs. This mechanism can be provided by the Agency or by the project proponent. As part of project review, if a project proponent is required to include interim or permanent structural and non-structural BMPs in project plans, and if the Agency does not provide a mechanism for BMP maintenance, the Agency shall require that the applicant provide verification of maintenance requirements through such means as may be appropriate, at the discretion of the Agency, including, but not limited to covenants, legal agreements, maintenance agreements, conditional use permits and/or funding arrangements (OC 2003).

### A-1.2 Maintenance Mechanisms

1. **Public entity maintenance:** The Agency may approve a public or acceptable quasi-public entity (e.g., the County Flood Control District, or annex to an existing assessment district, an existing utility district, a state or federal resource agency, or a conservation conservancy) to assume responsibility for operation, maintenance, repair and replacement of the BMP. Unless otherwise acceptable to individual Agencies, public entity maintenance agreements shall ensure estimated costs are front-funded or reliably guaranteed, (e.g., through a trust fund, assessment district fees, bond, letter of credit or similar means). In addition, the Permittees may seek protection from liability by appropriate releases and indemnities.

The Agency shall have the authority to approve stormwater BMPs proposed for transfer to any other public entity within its jurisdiction before installation. The Permittee shall be involved in the negotiation of maintenance requirements with any other public entities accepting maintenance responsibilities within their respective jurisdictions; and in negotiations with the resource agencies responsible for issuing permits for the construction and/or maintenance of the facilities. The Agency must be identified as a third party beneficiary empowered to enforce any such maintenance agreement within their respective jurisdictions.

2. **Project proponent agreement to maintain stormwater BMPs:** The Agency may enter into a contract with the project proponent obliging the project proponent to maintain, repair and replace the stormwater BMP as necessary into perpetuity. Security or a funding mechanism with a “no sunset” clause may be required.
  
3. **Assessment districts:** The Agency may approve an Assessment District or other funding mechanism created by the project proponent to provide funds for stormwater BMP maintenance, repair and replacement on an ongoing basis. Any agreement with such a District shall be subject to the Public Entity Maintenance Provisions above.
  
4. **Lease provisions:** In those cases where the Agency holds title to the land in question, and the land is being leased to another party for private or public use, the Agency may assure stormwater BMP maintenance, repair and replacement through conditions in the lease.
  
5. **Conditional use permits:** For discretionary projects only, the Agency may assure maintenance of stormwater BMPs through the inclusion of maintenance conditions in the conditional use permit. Security may be required.
  
6. **Alternative mechanisms:** The Agency may accept alternative maintenance mechanisms if such mechanisms are as protective as those listed above.

**Attachment A-2**

**Water Quality Management Plan and Stormwater BMP Transfer, Access and  
Maintenance Agreement**

Recorded at the request of:

County of: **San Bernardino**

After recording, return to:

County of: San Bernardino

County Clerk: \_\_\_\_\_

**Water Quality Management Plan and Stormwater BMP  
Transfer, Access and Maintenance Agreement**

**OWNER:** Prologis Logistics Services Inc.

**PROPERTY ADDRESS:** Valley Blvd and Commerce Center Drive.

City of Fontana, County of San Bernardino

**APN:** 0238-031-19

**THIS AGREEMENT** is made and entered into in Fontana **County**, California, this \_\_\_\_\_ day of

\_\_\_\_\_, by and between **Prologis Logistics Services Inc.**, herein after referred to as  
"Owner" and the **County of San Bernardino**, a municipal corporation, located in the County of San  
Bernardino, State of California hereinafter referred to as "County";

**WHEREAS**, the Owner owns real property ("Property") in the County of San Bernardino, State of  
California, more specifically described in Exhibit "A" and depicted in Exhibit "B", each of which exhibits is  
attached hereto and incorporated herein by this reference;

**WHEREAS**, at the time of initial approval of development project known as Prologis Park within the Property described herein, the County required the project to employ Best Management Practices, hereinafter referred to as “BMPs,” to minimize pollutants in urban runoff;

**WHEREAS**, the Owner has chosen to install and/or implement BMPs as described in the Water Quality Management Plan, on file with the County, hereinafter referred to as “WQMP”, to minimize pollutants in urban runoff and to minimize other adverse impacts of urban runoff;

**WHEREAS**, said WQMP has been certified by the Owner and reviewed and approved by the County;

**WHEREAS**, said BMPs, with installation and/or implementation on private property and draining only private property, are part of a private facility with all maintenance or replacement, therefore, the sole responsibility of the Owner in accordance with the terms of this Agreement;

**WHEREAS**, the Owner is aware that periodic and continuous maintenance, including, but not necessarily limited to, filter material replacement and sediment removal, is required to assure peak performance of all BMPs in the WQMP and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining to confined space and waste disposal methods, in effect at the time such maintenance occurs;

**NOW THEREFORE**, it is mutually stipulated and agreed as follows:

1. Owner hereby provides the County of County’s designee complete access, of any duration, to the BMPs and their immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by County’s Director of Public Works no advance notice, for the purpose of inspection, sampling, testing of the Device, and in case of emergency, to undertake all necessary repairs or other preventative measures at owner’s expense as provided in paragraph 3 below. County shall make every effort at all times to minimize or avoid interference with Owner’s use of the Property.
2. Owner shall use its best efforts diligently to maintain all BMPs in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by Owner and Owner’s representative or contractor in the removal and extraction of any material(s) from the BMPs and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and

regulations in effect at the time. As may be requested from time to time by the County, the Owner shall provide the County with documentation identifying the material(s) removed, the quantity, and disposal destination.

3. In the event Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) days of being given written notice by the County, the County is hereby authorized to cause any maintenance necessary to be done and charge the entire cost and expense to the Owner or Owner's successors or assigns, including administrative costs, attorneys fees and interest thereon at the maximum rate authorized by the Civil Code from the date of the notice of expense until paid in full.
  
4. The County may require the owner to post security in form and for a time period satisfactory to the County to guarantee the performance of the obligations state herein. Should the Owner fail to perform the obligations under the Agreement, the County may, in the case of a cash bond, act for the Owner using the proceeds from it, or in the case of a surety bond, require the sureties to perform the obligations of the Agreement. As an additional remedy, the Director may withdraw any previous stormwater-related approval with respect to the property on which BMPs have been installed and/or implemented until such time as Owner repays to County its reasonable costs incurred in accordance with paragraph 3 above.
  
5. This agreement shall be recorded in the Office of the Recorder of San Bernardino County, California, at the expense of the Owner and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth, and also a lien in such amount as will fully reimburse the County, including interest as herein above set forth, subject to foreclosure in event of default in payment.
  
6. In event of legal action occasioned by any default or action of the Owner, or its successors or assigns, then the Owner and its successors or assigns agree(s) to pay all costs incurred by the County in enforcing the terms of this Agreement, including reasonable attorney's fees and costs, and that the same shall become a part of the lien against said Property.
  
7. It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien there against.

8. The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto. The term "Owner" shall include not only the present Owner, but also its heirs, successors, executors, administrators, and assigns. Owner shall notify any successor to title of all or part of the Property about the existence of this Agreement. Owner shall provide such notice prior to such successor obtaining an interest in all or part of the Property. Owner shall provide a copy of such notice to the County at the same time such notice is provided to the successor.
  
9. Time is of the essence in the performance of this Agreement.
  
10. Any notice to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to the address set forth below. Notice(s) shall be deemed effective upon receipt, or seventy-two (72) hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.

**IF TO COUNTY:**

**IF TO OWNER:**

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**IN WITNESS THEREOF**, the parties hereto have affixed their signatures as of the date first written above.

**APPROVED AS TO FORM:**

**OWNER:**

---

County Attorney

---

Name

---

COUNTY OF

---

Title

---

Name

**OWNER:**

---

Name

---

Title

---

Title

**ATTEST:**

---

County Clerk                      Date





# **Attachment B Tables**

**Table B-2  
C Values Based on Impervious/Pervious Area Ratios**

% Impervious	% Pervious	C
0	100	0.15
5	95	0.19
10	90	0.23
15	85	0.26
20	80	0.30
25	75	0.34
30	70	0.38
35	65	0.41
40	60	0.45
45	55	0.49
50	50	0.53
55	45	0.56
60	40	0.60
65	35	0.64
70	30	0.68
75	25	0.71
80	20	0.75
85	15	0.79
90	10	0.83
95	5	0.86
100	0	0.90

**Notes:**

Obtain individual runoff coefficient C-Factors from the local agency or from the local flood control district.

If C-Factors are not available locally, obtain factors from hydrology text books or estimate using this table.

Composite the individual C-Factors using area-weighted averages to calculate the Composite C Factor for the area draining to a treatment control BMP.

Do not use the C-Factors in this table for flood control design or related work.

**Table B-1  
 303(d) List of Impaired Water Bodies**

Waterbody	Pollutant					
	Bacteria Indicators/ Pathogens	Metals	Nutrients	Organic Enrichment	Sedimentation/ Siltation	Suspended Solids
Big Bear Lake		X	X		X	
Canyon Lake (Railroad Canyon Reservoir)	X		X			
Chino Creek Reach 1	X		X			
Chino Creek Reach 2	X					
Cucamonga Creek, Valley Reach	X					
Grout Creek		X	X			
Knickerbocker Creek	X	X				
Lytle Creek	X					
Mill Creek (Prado Area)	X		X			X
Mill Creek Reach 1	X					
Mill Creek Reach 2	X					
Mountain Home Creek	X					
Mountain Home Creek, East Fork	X					
Prado Park Lake	X					
Rathbone (Rathbun Creek)			X			
Santa Ana River, Reach 3			X		X	
Santa Ana River, Reach 4	X					
Summit Creek			X			

**Notes:**

- 1) Summary of the 2006 303(d) Listed Water Bodies and Associated Pollutants of Concern from RWQCB Region 8. Check for updated lists from the RWQCB.
- 2) Chlorides, pesticides, salinity, total dissolved solids (TDS), toxic County, and trash are listed impairments within the 303(d) table; however, they are not impairments in the above waterbodies.



## Attachment C

# Pollutants of Concern

### **Pollutants of Concern**

- **Bacteria and Viruses** – Bacteria and Viruses are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water, containing excessive bacteria and viruses, can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.
- **Metals** – The primary source of metal pollution in stormwater is typically commercially available metals and metal products. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems. Metals are also raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. At low concentrations naturally occurring in soil, metals may not be toxic. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns, regarding the potential for release of metals to the environment, have already led to restricted metal usage in certain applications (OC 2003).
- **Nutrients** – Nutrients are inorganic substances, such as nitrogen and phosphorus. Excessive discharge of nutrients to water bodies and streams causes eutrophication, where aquatic plants and algae growth can lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms. Primary sources of nutrients in urban runoff are fertilizers and eroded soils.
- **Pesticides** -- Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Relatively low levels of the active component of pesticides can result in conditions of aquatic toxicity. Excessive or improper application of a pesticide may result in runoff containing toxic levels of its active ingredient (OC 2003).
- **Organic Compounds** – Organic compounds are carbon-based. Commercially available or naturally occurring organic compounds are found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to storm drains. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life (OC 2003).
- **Sediments** – Sediments are solid materials that are eroded from the land surface. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower

young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.

- **Trash and Debris** – Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash and debris may have a significant impact on the recreational value of a water body and aquatic habitat. Trash impacts water quality by increasing biochemical oxygen demand.
- **Oxygen-Demanding Substances** – This category includes biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins, carbohydrates, and fats are examples of biodegradable organic compounds. Compounds such as ammonia and hydrogen sulfide are examples of oxygen-demanding compounds. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions. A reduction of dissolved oxygen is detrimental to aquatic life and can generate hazardous compounds such as hydrogen sulfides.
- **Oil and Grease** – Oil and grease in water bodies decreases the aesthetic value of the water body, as well as the water quality. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids.



# **Attachment D**

## **Manufacturers Data**



**Hancor LandMax<sup>®</sup>**  
(Underground Retention / Detention Systems)

**Inspection / Maintenance  
Guidelines**

**October 2000**

Version S1.0



## **Hancor LandMax<sup>®</sup>**

### **Description / Basic Function**

LandMax<sup>®</sup> is a system comprised of a series of pipes and fittings that form an underground storage area, which retains or detains stormwater runoff from a given area. LandMax<sup>®</sup> can help achieve runoff storage and detainment required by local municipalities or other governing agencies when improving land use.

### **Retention**

The purpose of a LandMax<sup>®</sup> retention system is to capture stormwater runoff, store the runoff, and then allow it to percolate into the ground via perforations in the pipes. The system is backfilled with a Class I material (defined as crushed stone as per ASTM D2321) that allows more storage capacity in the system. The ground water is “recharged” with this type of system. The retention system utilizes perforated Sure-Lok F477 pipe.

### **Detention**

The purpose of a LandMax<sup>®</sup> detention system is to capture stormwater runoff, store the runoff, and then allow it to be released at a controlled rate through an outlet pipe. This type of system does not have perforations in the pipes and does not have to be backfilled with a Class I material. The detention system utilizes non-perforated Sure-Lok F477 pipe.

### **Concentric Reducers**

Concentric Reducers are fittings that transition between two pipes at perpendicular angles. The inverts of the two pipes compared to the fitting invert are at different elevations. When a concentric reducer is used to connect the header pipe to the lateral pipes, most debris will be trapped in the header pipe.

### **Eccentric Reducers**

Eccentric Reducers are fittings that transition between two pipes at perpendicular angles. The inverts of the two pipes compared to the fitting invert are at the same elevations. When an eccentric reducer is used to connect the header pipe to the lateral pipes, most debris will follow the flow of the stormwater into the lateral pipes.

### **Riser**

Each LandMax<sup>®</sup> system will have risers strategically placed for entrance of maintenance personnel into the system. These risers are typically 24” in diameter or larger.

### **Cleanouts**

Cleanout ports will be either 8” or 10” in diameter. They are used for entrance of a pipe from a vacuum truck or a water-jetting device.



### **Maintenance Overview for LandMax®**

The purpose of maintaining a clean and obstruction free LandMax® system is to ensure the system performs the intended function of the primary design. A build up of debris could clog the laterals in a retention system or block the entranceway of the outlet pipe in a detention system. This could cause the system to not function as originally designed. Downstream and upstream areas could run the risk of flooding and environmental issues, lawsuits, and regulatory noncompliance could become inevitable.

### **Inspection / Maintenance Frequency for LandMax®**

All retention and detention systems need to be cleaned and maintained. Underground systems can be maintained more cost effectively if these simple guidelines are adhered to and this maintenance schedule is applicable to all underground systems. Inspect a minimum of once per year and clean at your discretion to maintain proper storage, flow and prevent clogging. Generally, the best time to schedule inspection is during the time of year when the least amount of rainfall is expected. This is typically found to be the months of July through September. Consult a local weather expert or historical rainfall data to determine when the least amount of rainfall is expected in your area. This does not mean inspection or cleaning cannot be done anytime during the course of a year.

### **Pre-Inspection of LandMax®**

An inspection should be performed when the system is new. This allows the owner to measure the invert prior to accumulation of sediment. This survey will allow the monitoring of sediment build-up without entering the LandMax system; thereby eliminating the need for confined space entry. Documentation of pre-inspection data should be captured on the attached form.

**Pre-Inspection** - LandMax® should be inspected immediately after installation.

### **Procedures**

- 1) Locate the riser sections or cleanouts of the LandMax® system. The riser will typically be 24" in diameter or larger and the cleanouts are usually 8" or 10" in diameter.
- 2) Remove the lid of the risers or clean outs.
- 3) Insert a measuring device into opening and make note to a point of reference on the stick or string. (This is done so that sediment build up can be determined in the future without having to enter system.)

**Inspection** - LandMax® should be inspected at a minimum of one time a year. Furthermore, the system might require inspection after major rain events.

### **Procedures**

- 4) Locate the riser section of LandMax® system. The riser will typically be 24" in diameter or larger.
- 5) Remove the lid of the riser.
- 6) Measure the sediment buildup at each riser and cleanout location. Only certified confined space entry personnel having appropriate equipment should be allowed to enter the LandMax System.
- 7) Inspect each header, laterals, and outlet pipes for obstructions. Obstructions should be removed at this time.
- 8) Inspect pipes for any structural damage.
- 9) Fill in the Hancor LandMax® Inspection/Maintenance Data Sheet and send a copy to Hancor for data collection.



**Maintenance** - LandMax<sup>®</sup> should be considered for cleaning if there is a sediment buildup between 5% to 20% of the pipe diameter. Cleaning should be performed if sediment buildup is greater than 20%. Furthermore, the system may need cleaning in the event of a spill of a foreign substance.

### Procedures

- 1) Locate the riser section of LandMax<sup>®</sup> system. The riser will typically be 24" in diameter or larger.
- 2) Remove the lid of the riser.
- 3) Measure the sediment buildup at each riser and cleanout location. Only certified confined space entry personnel having appropriate equipment should be allowed to enter the LandMax System.
- 4) Inspect each header, laterals, and outlet pipes for obstructions. Obstructions should be removed at this time.
- 5) A thorough cleaning of the system (headers and laterals) shall be performed by either manual methods or by a vacuum truck.
- 6) Inspect pipes for any structural damage.
- 7) Fill in the Hancor LandMax<sup>®</sup> Inspection/Maintenance Data Sheet and send a copy to Hancor for data collection.

### Inspection / Maintenance Requirements for LandMax<sup>®</sup>

Listed below is some recommendations for equipment and training for personnel to enter these systems.

- Personnel – OSHA Confined Space Entry Training is a prerequisite for entrance to a system. (These systems are defined as confined spaces).
- Equipment –  
Record taking (pen, paper, voice recorder)  
Proper clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)  
Flashlight  
Tape measure  
Measuring stick  
Pry bar or miscellaneous tools  
Flagging, barricades, or cones  
First aid materials  
Debris / Contaminant Collectors  
Debris / Contaminant Containers  
Vacuum truck (optional)

*\* The above are some of the items needed for confined space entry. Please refer to OSHA guidelines for a complete list of equipment.*

### Material Disposal

Owners should contact their local public works department for proper disposal of debris or contaminants. The Environmental Protection Agency or any other necessary governing body should also be consulted prior to the disposing of any exhumed material from a system.



**Reporting of findings:**

Information may be sent to Hancor by one of these methods.

FAX: 888-FAX-PIPE (329-7473)

E-MAIL: [drainage@hancor.com](mailto:drainage@hancor.com)

MAIL: HANCOR, INC.  
ATTN: APPLICATION ENGINEERING  
401 OLIVE STREET  
FINDLAY, OHIO 45840

Note: Hancor may be reached at 888-FOR-PIPE (367-7473) or through the Hancor website ([www.hancor.com](http://www.hancor.com)).



Hancor LandMax® Inspection/Maintenance Data Sheet

Date of Inspection: \_\_\_\_\_ Inspected By: \_\_\_\_\_

Date of last inspection: \_\_\_\_\_

Date of last maintenance: \_\_\_\_\_

**SYSTEM**

Location of System: \_\_\_\_\_ (city-state) Date System Installed: \_\_\_\_\_

Detailed directions: \_\_\_\_\_

\_\_\_\_\_

Pipe Diameter Size: \_\_\_\_\_ Concentric \_\_\_ Eccentric \_\_\_ Reducers

Retention \_\_\_ Detention \_\_\_ System

Number of Headers: \_\_\_\_\_

Number of Laterals: \_\_\_\_\_

Number and Diameter Size of Clean Outs: \_\_\_\_\_

Estimated average flow into system: \_\_\_\_\_

(Drainage Area)

Is there any pretreatment of influent: YES \_\_\_ NO \_\_\_

Other pertinent, useful, or unusual information regarding the system or surrounding conditions: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Sketch of System:**

**Obtain and review any previous reporting of this system.**



**Data Recording:**

Riser/ Cleanout	Dia. of Header/ Lateral	Measurement to Finished Surface	Less Original Mea. Finished Surface	Change	% of Header/ Lateral	Clean-out System (yes/no)

***Note: 5% to 20% of pipe diameter, Maintenance should be considered; > 20% Maintenance should be performed)***

**\*\*\*\*Refer to Recommended Maintenance Procedures**



**Hancor LandMax<sup>®</sup>**  
(Underground Retention / Detention Systems)

**Inspection / Maintenance  
Guidelines**

**October 2000**

Version S1.0



## **Hancor LandMax®**

### **Description / Basic Function**

LandMax® is a system comprised of a series of pipes and fittings that form an underground storage area, which retains or detains stormwater runoff from a given area. LandMax® can help achieve runoff storage and detention required by local municipalities or other governing agencies when improving land use.

### **Retention**

The purpose of a LandMax® retention system is to capture stormwater runoff, store the runoff, and then allow it to percolate into the ground via perforations in the pipes. The system is backfilled with a Class I material (defined as crushed stone as per ASTM D2321) that allows more storage capacity in the system. The ground water is “recharged” with this type of system. The retention system utilizes perforated Sure-Lok F477 pipe.

### **Detention**

The purpose of a LandMax® detention system is to capture stormwater runoff, store the runoff, and then allow it to be released at a controlled rate through an outlet pipe. This type of system does not have perforations in the pipes and does not have to be backfilled with a Class I material. The detention system utilizes non-perforated Sure-Lok F477 pipe.

### **Concentric Reducers**

Concentric Reducers are fittings that transition between two pipes at perpendicular angles. The inverts of the two pipes compared to the fitting invert are at different elevations. When a concentric reducer is used to connect the header pipe to the lateral pipe, most debris will be trapped in the header pipe.

### **Eccentric Reducers**

Eccentric Reducers are fittings that transition between two pipes at perpendicular angles. The inverts of the two pipes compared to the fitting invert are at the same elevations. When an eccentric reducer is used to connect the header pipe to the lateral pipes, most debris will follow the flow of the stormwater into the lateral pipes.

### **Riser**

Each LandMax® system will have risers strategically placed for entrance of maintenance personnel into the system. These risers are typically 24” in diameter or larger.

### **Cleanouts**

Cleanout ports will be either 8” or 10” in diameter. They are used for entrance of a pipe from a vacuum truck or a water-jetting device.



### Maintenance Overview for LandMax®

The purpose of maintaining a clean and obstruction free LandMax® system is to ensure the system performs the intended function of the primary design. A build up of debris could clog the laterals in a retention system or block the entranceway of the outlet pipe in a detention system. This could cause the system to not function as originally designed. Downstream and upstream areas could run the risk of flooding and environmental issues, lawsuits, and regulatory noncompliance could become inevitable.

### Inspection / Maintenance Frequency for LandMax®

All retention and detention systems need to be cleaned and maintained. Underground systems can be maintained more cost effectively if these simple guidelines are adhered to and this maintenance schedule is applicable to all underground systems. Inspect a minimum of once per year and clean at your discretion to maintain proper storage, flow and prevent clogging. Generally, the best time to schedule inspection is during the time of year when the least amount of rainfall is expected. This is typically found to be the months of July through September. Consult a local weather expert or historical rainfall data to determine when the least amount of rainfall is expected in your area. This does not mean inspection or cleaning cannot be done anytime during the course of a year.

### Pre-Inspection of LandMax®

An inspection should be performed when the system is new. This allows the owner to measure the invert prior to accumulation of sediment. This survey will allow the monitoring of sediment build-up without entering the LandMax system; thereby eliminating the need for confined space entry. Documentation of pre-inspection data should be captured on the attached form.

**Pre-Inspection** - LandMax® should be inspected immediately after installation.

### Procedures

- 1) Locate the riser sections or cleanouts of the LandMax® system. The riser will typically be 24" in diameter or larger and the cleanouts are usually 8" or 10" in diameter.
- 2) Remove the lid of the risers or clean outs.
- 3) Insert a measuring device into opening and make note to a point of reference on the stick or string. (This is done so that sediment build up can be determined in the future without having to enter system.)

**Inspection** - LandMax® should be inspected at a minimum of one time a year. Furthermore, the system might require inspection after major rain events.

### Procedures

- 4) Locate the riser section of LandMax® system. The riser will typically be 24" in diameter or larger.
- 5) Remove the lid of the riser.
- 6) Measure the sediment buildup at each riser and cleanout location. Only certified confined space entry personnel having appropriate equipment should be allowed to enter the LandMax System.
- 7) Inspect each header, laterals, and outlet pipes for obstructions. Obstructions should be removed at this time.
- 8) Inspect pipes for any structural damage.
- 9) Fill in the Hancor LandMax® Inspection/Maintenance Data Sheet and send a copy to Hancor for data collection.



**Maintenance** - LandMax<sup>®</sup> should be considered for cleaning if there is a *sediment buildup between 5% to 20%* of the pipe diameter. Cleaning should be performed if *sediment buildup is greater than 20%*. Furthermore, the system may need cleaning in the event of a spill of a foreign substance.

### Procedures

- 1) Locate the riser section of LandMax<sup>®</sup> system. The riser will typically be 24" in diameter or larger.
- 2) Remove the lid of the riser.
- 3) Measure the sediment buildup at each riser and cleanout location. Only certified confined space entry personnel having appropriate equipment should be allowed to enter the LandMax System.
- 4) Inspect each header, laterals, and outlet pipes for obstructions. Obstructions should be removed at this time.
- 5) A thorough cleaning of the system (headers and laterals) shall be performed by either manual methods or by a vacuum truck.
- 6) Inspect pipes for any structural damage.
- 7) Fill in the *Hancor LandMax<sup>®</sup> Inspection/Maintenance Data Sheet* and send a copy to Hancor for data collection.

### Inspection / Maintenance Requirements for LandMax<sup>®</sup>

Listed below is some recommendations for equipment and training for personnel to enter these systems.

- |             |  |
|-------------|--|
| Personnel – | OSHA Confined Space Entry Training is a prerequisite for entrance to a system. (These systems are defined as confined spaces).   |
| Equipment – | Record taking (pen, paper, voice recorder)<br>Proper clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)<br>Flashlight<br>Tape measure<br>Measuring stick<br>Pry bar or miscellaneous tools<br>Flagging, barricades, or cones<br>First aid materials<br>Debris / Contaminant Collectors<br>Debris / Contaminant Containers<br>Vacuum truck (optional) |

*\* The above are some of the items needed for confined space entry. Please refer to OSHA guidelines for a complete list of equipment.*

### Material Disposal

Owners should contact their local public works department for proper disposal of debris or contaminants. The Environmental Protection Agency or any other necessary governing body should also be consulted prior to the disposing of any exhumed material from a system.



**Reporting of findings:**

Information may be sent to Hancor by one of these methods.

FAX: 888-FAX-PIPE (329-7473)

E-MAIL: [drainage@hancor.com](mailto:drainage@hancor.com)

MAIL: HANCOR, INC.  
ATTN: APPLICATION ENGINEERING  
401 OLIVE STREET  
FINDLAY, OHIO 45840

Note: Hancor may be reached at 888-FOR-PIPE (367-7473) or through the Hancor website ([www.hancor.com](http://www.hancor.com)).



Hancor LandMax<sup>®</sup> Inspection/Maintenance Data Sheet

Date of Inspection: \_\_\_\_\_ Inspected By: \_\_\_\_\_

Date of last inspection: \_\_\_\_\_

Date of last maintenance: \_\_\_\_\_

**SYSTEM**

Location of System: \_\_\_\_\_ (city-state) Date System Installed: \_\_\_\_\_

Detailed directions: \_\_\_\_\_  
\_\_\_\_\_

Pipe Diameter Size: \_\_\_\_\_ Concentric \_\_\_ Eccentric \_\_\_ Reducers

Retention \_\_\_ Detention \_\_\_ System

Number of Headers: \_\_\_\_\_ Number of Laterals: \_\_\_\_\_

Number and Diameter Size of Clean Outs: \_\_\_\_\_

Estimated average flow into system: \_\_\_\_\_  
(Drainage Area)

Is there any pretreatment of influent: YES \_\_\_ NO \_\_\_

Other pertinent, useful, or unusual information regarding the system or surrounding conditions: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Sketch of System:**

**Obtain and review any previous reporting of this system.**



**Data Recording:**

Riser/ Cleanout	Dia. of Header/ Lateral	Measurement to Finished Surface	Less Original Mea. Finished Surface	Change	% of Header/ Lateral	Clean-out System (yes/no)

***Note: 5% to 20% of pipe diameter, Maintenance should be considered; > 20% Maintenance should be performed)***

**\*\*\*\*Refer to Recommended Maintenance Procedures**

## **Hancor LandMax<sup>®</sup> (Underground Retention / Detention Systems) Inspection / Maintenance Guidelines**

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This is for informational purposes only and is meant only to be a guide. Individuals using this information should make their own decisions as to suitability of this guideline for their individual projects and adjust accordingly.

### **Hancor LandMax<sup>®</sup>**

#### **Description / Basic Function**

LandMax<sup>®</sup> is a system comprised of a series of pipes and fittings that form an underground storage area, which retains or detains stormwater runoff from a given area. LandMax<sup>®</sup> can help achieve runoff storage and detainment required of local municipalities or other governing agencies when improving land use or storm water management requirements (EPA Phase II).

#### **Retention**

The purpose of a LandMax<sup>®</sup> retention system is to capture stormwater runoff, store the runoff, and then provide a means for groundwater recharge by allowing the stored runoff to percolate into the ground through perforations in the pipes. The system is backfilled with a Class I material, defined as ½" to 2" clean crushed stone as per ASTM D2321. The backfill material will allow for more storage capacity than the pipe alone. The retention system utilizes perforated Hancor Hi-Q or Sure-Lok F477 pipe.

#### **Detention**

The purpose of a LandMax<sup>®</sup> detention system is to capture stormwater runoff, store the runoff, and then allow it to be released at a controlled rate through an outlet pipe. This type of system does not have perforations in the pipes and does not have to be backfilled with a Class I material. The detention system utilizes non-perforated Sure-Lok F477 pipe or Blue Seal pipe.

#### **Concentric Reducers**

Concentric Reducers are fittings that transition between two pipes at perpendicular angles. The centerlines of the two pipes are at the same elevation. When a concentric reducer is used to connect the header pipe to the lateral pipe, most debris will be trapped in the header pipe.

## **Eccentric Reducers**

*Eccentric Reducers are fittings that transition between two pipes at perpendicular angles. The inverts of the two pipes are at the same elevations. When an eccentric reducer is used to connect the header pipe to the lateral pipes, most debris will follow the flow of the stormwater into the lateral pipes.*

## **Riser**

Each LandMax<sup>®</sup> system should have risers strategically placed for entrance of maintenance personnel into the system. These risers are typically 24" in diameter or larger.

## **Clean Outs**

Clean out ports are usually 8" or 10" in diameter. They are used for entrance of a pipe from a vacuum truck or a water-jetting device.

## **Maintenance Overview for LandMax<sup>®</sup>**

The purpose of maintaining a clean and obstruction free LandMax<sup>®</sup> system is to ensure the system performs the intended function of the primary design. A build up of debris could clog the laterals in a retention system or block the entranceway of the outlet pipe in a detention system. This could cause failure of the system or hinder the function for which it was originally designed. Downstream and upstream areas could run the risk of damage due to flooding or other unwanted outcomes.

## **Inspection / Maintenance Frequency for LandMax<sup>®</sup>**

All retention and detention systems need to be cleaned and maintained. Underground systems can be maintained more cost effectively if these simple guidelines are adhered to. This maintenance schedule is applicable to all underground systems. Inspection should be performed at a minimum of once per year. Cleaning should be done at the discretion of individuals responsible to maintain proper storage and flow. Generally, the best time to schedule an inspection is during the time of year when the least amount of rainfall is expected. This is typically found to be the months of July through September. Consult a local weather expert or historical rainfall records to determine when the least amount of rainfall is expected in your area. This does not mean inspection or cleaning cannot be done anytime during the course of a year.

## **Pre-Inspection of LandMax<sup>®</sup>**

An inspection should be performed when the system is new. This allows the owner to measure the invert prior to accumulation of sediment. This survey will allow the monitoring of sediment

build-up without entering the LandMax system. Thereby eliminating the need for confined space entry. Documentation of pre-inspection data should be captured on the attached form.

**Pre-Inspection** - LandMax<sup>®</sup> should be inspected immediately after installation.

## Procedures

- 1) Locate the riser section or cleanouts of the LandMax<sup>®</sup> system. The riser will typically be 24" in diameter or larger and the cleanouts are usually 8" or 10" in diameter.
- 2) Remove the lid of the riser or clean outs.
- 3) Insert a measuring device into the opening and make note to a point of reference on the stick or string. (This is done so that sediment build up can be determined in the future without having to enter system.)
- 4) Fill in the Hancor LandMax<sup>®</sup> *Inspection / Maintenance Data Sheet*. This data can be kept and used to fill in subsequent Data Sheets during future maintenance and inspections.

**Inspection** - LandMax<sup>®</sup> should be inspected at a minimum of one time a year or possibly after major rain events.

## Procedures

- 1) Locate the riser section of the LandMax<sup>®</sup> system. The riser will typically be 24" in diameter or larger.
- 2) Remove the lid of the riser.
- 3) Measure the sediment buildup at each riser and cleanout location. Only certified confined space entry personnel having appropriate equipment should be allowed to enter the LandMax System.
- 4) Inspect each header, all laterals and outlet pipes for sediment build up, obstructions or other problems. Obstructions should be removed at this time.
- 5) Fill in the Hancor LandMax<sup>®</sup> Inspection / Maintenance Data Sheet.

**Maintenance** – The LandMax<sup>®</sup> system should be considered for cleaning if there is a sediment buildup between 5% to 20% of the pipe diameter. Cleaning should be performed if sediment buildup is greater than 20%. The system may require cleaning in the event of a spill of a toxic or foreign substance.

## Procedures

- 1) Locate the riser section of the LandMax<sup>®</sup> system. The riser will typically be 24" in diameter or larger.
- 2) Remove the lid of the riser.

- 3) Measure the sediment buildup at each riser and cleanout location. Only certified confined space entry personnel having appropriate equipment should be allowed to enter the LandMax System.
- 4) Inspect each header, laterals and outlet pipes for sediment build up, obstructions or other problems. Obstructions should be removed at this time.
- 5) A thorough cleaning of the system (headers and laterals) shall be performed by either manual methods or by a vacuum truck.
- 6) Fill in the Hancor LandMax® Inspection / Maintenance Data Sheet.

### **Inspection / Maintenance Requirements for LandMax®**

Listed below are some recommendations for equipment and training for personnel to enter these systems.

Personnel – OSHA Confined Space Entry Training is a prerequisite for entrance to a system. (These systems are defined as confined spaces).

Equipment – Record taking (pen, paper, voice recorder)  
Proper clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)  
Flashlight  
Tape measure  
Measuring stick  
Pry bar or miscellaneous tools  
Flagging, barricades, or cones  
First aid materials  
Debris / Contaminant Collectors  
Debris / Contaminant Containers  
Vacuum truck (optional)

\* The above are some of the items needed for confined space entry. Please refer to OSHA guidelines for a complete list of equipment.

### **Material Disposal**

Owners should contact their local public works department for proper disposal of debris or contaminants. The Environmental Protection Agency or any other necessary governing body should also be consulted prior to the disposing of any exhumed material from a system.

## Hancor LandMax® Inspection / Maintenance Data Sheet

Date of Inspection: \_\_\_\_\_ Inspected By: \_\_\_\_\_

Date of last inspection: \_\_\_\_\_

Date of last maintenance: \_\_\_\_\_

### SYSTEM

Location of System: \_\_\_\_\_ (city-state) Date System Installed: \_\_\_\_\_

Detailed directions: \_\_\_\_\_  
\_\_\_\_\_

Pipe Diameter Size: \_\_\_\_\_ **Reducers:** Concentric \_\_\_ Eccentric \_\_\_

**System:** Retention \_\_\_ Detention \_\_\_

Number of Headers: \_\_\_\_\_ Number of Laterals: \_\_\_\_\_

Number and Diameter Size of Clean Outs: \_\_\_\_\_

Estimated average flow into system: \_\_\_\_\_  
(Drainage Area)

Is there any pretreatment of influent: YES \_\_\_ NO \_\_\_

Other pertinent, useful, or unusual information regarding the system or surrounding conditions: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Sketch of System:**

**Obtain and review any previous reporting of this system.**

**Data Recording:**

Riser/ Cleanout  A	Dia. of Header/ Lateral  B	Measurement to Finished Surface  C	Original Measurement Finished Surface  D	Change  E = D- C	% of Header/ Lateral  F	Clean-out System (yes/no)  G

**OBSERVATIONS**

Standing water in header (one or both): YES \_\_\_\_\_ NO \_\_\_\_\_

Details: \_\_\_\_\_

Silt or debris in header (one or both): YES \_\_\_\_\_ NO \_\_\_\_\_

**% Buildup:** \_\_\_\_\_ *(5% to 20% of pipe diameter, Maintenance should be considered; > 20% Maintenance should be performed)*

Details: \_\_\_\_\_

Oil / Grease in header (one or both): YES \_\_\_\_\_ NO \_\_\_\_\_

Details: \_\_\_\_\_

Obstructions from header to laterals or outlet pipe: YES \_\_\_\_\_ NO \_\_\_\_\_

Details: \_\_\_\_\_



## Attachment E

### Interviews with Agencies

**Notes of a Phone conversation** on April 24, 2007 (a follow up to an April 18, 2007 conversation) with **Adam Fischer** of the State of California's Santa Ana Regional Water Quality control Board Region 8.

Santa Ana River Watershed

When questioned about the HCOC sections of the Santa Ana River mentioned by the other agencies.

Adam's response-

Hydraulic condition of concern (HCOC) is a term that is being over thought by everyone. He wants everyone to under think it. Until the channel is completely studied and concrete lined from Ocean to mountains, it is hydraulic condition of concern. This includes where a site is draining, and whether or not water may be beneficial to the channel is not a relevant issue.

No studies say whether a riparian area will survive a 100 year level flood or if it is able to recover from the devastating flows.

There is insufficient data available as to the status of the Santa Ana River and the effects of storm water Urban runoff and development flows have not been reviewed either.

When questioned about the riparian areas and the urban flows supplying the needed clean water to survive. For instance the military base closure.

Adam's response-

The military base flows were primarily coming off the golf course and supplying the needed flows. Right now most of the flows coming from the POTWs is supplying water to many of the areas. The base flows coming from the POTWs are not a guarantee of flows either could stop. But there is not an option of allowing additional volumes of water to the base flow for their survival.

Closing comment by Adam-

The enforcement of the current guidelines must be followed by the local agencies and the Regional Board will hold the agencies responsible. The current county guidelines state that if an HCOC exists, the detention of flows is required.

Per Adam, in his opinion, an HCOC does exist for the River in 'all' sections.

**Notes of the phone conversation with Girish Dasei, Army Corp of Engineers – project manager for the Santa Ana River. April 13, 2007**

The Corp is working on Prado Dam in the mainstem project The Dam is being raised to provide a 190year protection level of protection. The work will be completed in Oct 2008 for the 2008 to 2009 rain season.

There are no plans for work upstream of the dam in the foreseeable future. The river currently handles the needed 100 year storm within the river banks upstream of the dam and handles a 190 year storm downstream. Channel banks of Santa Ana river are designed to handle 100 year flows above dam with the river bottom alignment allowed to change naturally as needed.

The dam is currently flowing 300 to 400 cfs baseflow out for dry season (as of this date, 4-13-2007 we have had approximately 1.5 to 2 inches of rain this season) Orange county is capturing all of the flows for recharge

Tributaries are not a concern with Girish unless they belong to corp. The only areas noted by the corp is in the Santa Ana river, two areas show degradation one at Mill Creek and the other at San Timeoteo junction.

The corp states that the city and county are responsible for flood plain management.

Other notes

Seven Oaks dam is managed by San Bernardino county and provides a 350 year level of protection

Prado Dam flows from the outlet was Old design was 10,000 cfs out but now for the new design is for 30,000 cfs out

**Notes of the phone conversation with Hayley Lovan, Army Corp of Engineers, Environmental coordinator for the Santa Ana River. April 12, 2007**

Hayley is the coordinator for Santa Ana River and tributaries from the mouth up to the Star Canyon Dam (verify name of canyon)

Riparian areas are biggest concern these are the areas that provide the habitat for the various species.

The Least Bell Vireo and gnatcatcher are high populations along the river. Most up to and in the Prado Dam region. Prado is a preserve for the Least Bell Vireo which is a primary reason so many birds exist in the region.

Non-native species are being aggressively removed from nesting areas, birds such as cowbirds.

A multi species habitat plan is being prepared but not available yet.

Hayley is uncertain of the needs for protection on the river.

Large populations of Brown trout and Catfish in dam area and in river. When the dam is drained, large populations of brown trout are apparent. Brown trout and catfish are affecting the Santa Ana River sucker fish population. Santa Ana River sucker is not being found south of Prado. It lives in the tributaries primarily and washes into Santa Ana river.

#### Recommended contacts

##### Regulatory

Mark Durham  
1-213-452-3416

Kurwin Russell (fisherman and river conservation resources)  
951-683-7691 ext 203

Interview with Kerwin Russell, Resource Management Specialist April 18, 2007  
951-683-7691 ext 203 at

#### Riverside-Corona Resource Conservation District

##### Discussion of the Santa Ana River from Seven Oaks to ocean

- from Norton Airforce base to warm springs in city of San Bernardino.
  - o Closure of base has dried up the water in the area of the base. The existing domestic flows were creating a riparian habitat. Less water is now flowing in the area so the area is dying. Fish have left with the receding waters.
- I-10 to La Cadena
  - o Blue gill, green sunfish
- Rialto to Wier canyon
  - o River sucker and chub
- La Cadena to Van Buren
  - o Talapia in better conditions, not found in 2007.

- Van Buren to I-15 very wide and shallow (100 ft wide, ankle deep)
  - o Arundo plant
  - o Some chub and sucker fish because of smaller size and their ability to hide in small tributaries
  - o I-15 to Prado
    - Carp
- Prado to Wier Canyon
  - o Exotics, carp, cat, large bass
- Santa Ana river to ocean
  - o Exotics are most of the population

POTW publicly owned treatment works currently accounts for 90% of flow in the river 300-400 cfs as of April 2007

The POTWs are supplying most of the flows, but these are not considered desirable because of the pollutants.

Silt, TSS, biggest problem in the river.

More base flow is needed

Prior to the construction of Prado, a rumor of salmon in stream. Circa 1930

A lot of the riparian areas owe their existence to development. The domestic water flows are adding clean water to the river.

The area at Norton had a riparian habitat when the base was occupied. When the base was closed, the water flows decreased and the riparian has died. Taking with it fish and vegetation.



# Attachment F

## Hydrologic Units

Index to map of the Santa Ana Hydrologic Basin  
Planning Area (SA), 1986

Abbreviations Used:

HA – Hydrologic Area  
HSA - Hydrologic Subarea

801.0	SANTA ANA RIVER HYDROLOGIC UNIT
801.10	Lower Santa Ana River HA
801.11	East Coastal Plain HSA
801.12	Santiago HSA
801.13	Santa Ana Narrows HSA
801.20	Middle Santa Ana River HA Split
801.21	Chino HSA Split
481.21	Chino HSA Split
481.22	Harrison HAS
801.23	Claremont Heights HSA Split
481.23	Claremont Heights HSA Split
801.24	Cucamonga HSA
801.25	Temescal HSA
801.26	Arlington HSA
801.27	Riverside HSA
801.30	Lake Mathews HSA
801.31	Coldwater HSA
801.32	Bedford HSAS
801.33	Cajalco HSA
801.34	Lee Lake HSA
801.35	Terra Cotta HSA
801.40	Colton- Rialto HA
801.41	Upper Lytle HSA
801.42	Lower Lytle HSA
801.43	Rialto HSA
801.44	Colton HSA
801.50	Upper Santa Ana River HA
801.51	Cajon HSA
801.52	Bunker Hill HSA
801.53	Redlands HSA

801.54	Mentone HSA
801.55	Reservoir HSA
801.56	Crafton HSA
801.57	Santa Ana Canyon HSA
801.58	Mill Creek HSA
801.59	Sycamore HAS
801.60	San Timoteo HA
801.61	Yucaipa HSA
801.62	Beaumont HSA
801.63	Cherry Valley HSA
801.64	Chicken Hill HSA
801.65	Gateway HSA
801.66	Oak Glen HSA
801.67	South Mesa HSA
801.68	Triple Falls Creek HSA
801.69	Noble Creek HAS
801.70	San Bernardino Mountain HA
801.71	Bear Valley HSA
801.72	Seven Oaks HSA
801.73	Baldwin HSA
802.0	SAN JACINTO VALLEY HYDROLOGIC UNIT
802.10	Perris HA
802.11	Perris Valley HSA
802.12	Menifee HSA
802.13	Winchester HSA
802.14	Lakeview HSA
802.15	Hemet HAS
802.20	San Jacinto HA
802.21	Gilman Hot Springs HSA
802.22	Hemet Lake HSA
802.23	Bautista HAS
802.30	Elsinore Valley HA
802.31	Elsinore HSA
802.32	Railroad HSA
805.0	LOS ANGELES-SAN GABRIEL RIVER HYDROLOGIC UNIT
805.10	Coastal Plain of Los Angeles County HA split
845.15	Central HSA Split
845.60.1.1	Anaheim HA Split
845.61	Anaheim HSA Split
845.62	La Habra HSA Split
845.63	Yorba Linda HSA Split

Notes:

1. The digitized version of the map that this index accompanies was reproduced from an August 1986 revision of a map entitled, "Santa Ana Hydrologic Basin Planning Area (SA)," State of California Regional Water Quality Control Board, Santa Ana Region (8), that was included in the Water Quality Control Plan for the Santa Ana River Basin – Region 8, 1994.
  
2. The naming conventions used in this index are the same as used by the Department of Water Resources in their Bulletin 130 series. Bulletin 130 was last published in May 1988, for the 1982-85 water year. The numbering system used on the accompanying map is an adaptation of the numbering system used in Bulletin 130.
  
3. The boundary between Regional Water Quality Control Boards 4 and 8 is specified in California Water Code Section 13200 as coinciding with the southeasterly boundary of Los Angeles County from the Pacific Ocean to San Antonio Peak. Therefore, the boundary between these two regions is not a hydrologic boundary, but a political one. Consequently, some, or parts of some, of the hydrologic subunits shown in the Santa Ana River watershed are within the jurisdiction of the RWQCB 4, and some, or parts of some, hydrologic units are in the San Gabriel River watershed of RWQCB 4, but are legally in Region 8.
  
4. Parts of the southwestern boundary shown for HSA 801.11 East Coastal Plain do not conform exactly to the boundary shown for this area in the Calwater hydrologic mapping project Version 2.2. This lack of conformity affects the area of Laguna Hills, but is insignificant at the scale of this map.
  
5. The boundary of Region 8 at southwestern tip of HSA 802.24 Bautista shown has been modified as a result of the construction of Diamond Valley Reservoir. This modification affects the area of Goodhart Canyon, but is insignificant at the scale of this map.

