

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2013-_____

NPDES PERMIT CA0083399

FACT SHEET
FOR
CITY OF BAKERSFIELD AND COUNTY OF KERN
STORM WATER DISCHARGES FROM
MUNICIPAL SEPARATE STORM SEWER SYSTEM
KERN COUNTY

I. PURPOSE

The Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) will be considering renewal of the Waste Discharge Requirements (WDR) Order/National Pollutant Discharge Elimination System (NPDES) Permit (Order) that regulates discharges from the Municipal Separate Storm Sewer System (MS4) of the City of Bakersfield and the County of Kern, hereafter referred to as Permittees. This Fact Sheet provides the Permittees and interested persons an overview of the proposed Order and provides the technical basis for the permit requirements.

The proposed Order specifies requirements necessary for the Permittees to reduce the discharge of pollutants in urban runoff to the maximum extent practicable (MEP). Since compliance with the MEP standard is an iterative process, the Permittees' storm water programs must continually be assessed and modified as urban runoff management knowledge increases to incorporate improved programs, control measures, best management practices (BMPs), etc. in order to achieve the MEP standard. This continual assessment, revision, and improvement of storm water management program implementation is expected to achieve compliance with water quality standards.

II. THE NEED TO REGULATE STORM WATER DISCHARGES

The National Urban Runoff Program (NURP) Study [U.S. Environmental Protection Agency (U.S. EPA) 1983] showed that MS4 discharges draining from residential, commercial, and light industrial areas contain significant loadings of total suspended solids. Although the NURP Study did not cover industrial sites, the study suggested that runoff from industrial sites may have significantly higher contaminant levels than runoff from other urban land use sites. Several studies tend to support this observation. For example, in Fresno, a NURP project site, industrial areas had the poorest storm water quality of the four land uses evaluated. The study found that pollutant levels from illicit discharges were high enough to significantly degrade receiving water quality and threaten aquatic life, wildlife, and human health.

The National Water Quality Inventory Reports to Congress [305(b) Report]¹ prepared by the U.S. EPA indicate that storm water runoff and urban runoff remain one of the top ten causes of water quality impairments in rivers, lakes, and estuaries.

According to the NURP, if not properly controlled and managed, urbanization could result in the discharge of pollutants in urban runoff. "America's Clean Water-The States' Nonpoint Source Assessment, 1985" and the Biennial National Water Quality Inventory Reports to Congress cite urban runoff as a major source of beneficial use impairment. Urban area runoff may contain² elevated levels of pathogens (e.g., bacteria, protozoa, viruses), sediment, trash, fertilizers (nutrients, compounds of nitrogen and phosphorus), pesticides (e.g., DDT, Chlordane, Diazinon, Chlorpyrifos), heavy metals (e.g., cadmium, chromium, copper, lead, zinc), and petroleum products (e.g., oil, grease, petroleum hydrocarbons, polycyclic aromatic hydrocarbons). Urban runoff can carry these pollutants to rivers, streams, lakes, bays and the ocean. In addition, increased flows due to urbanization may increase erosion of stream banks and channels and cause stream channel alterations and impact aquatic resources.

III. Benefits of Permit Program Implementation

Implementation of BMPs should reduce pollutant discharges, and improve surface water quality. The expected benefits of implementing the provisions of the City of Bakersfield and County of Kern MS4 NPDES permit include:

1. **Enhanced Aesthetic Value:** Storm water pollution may affect the appearance and quality of a water body, and the desirability of working, living, traveling, or owning property near that water body. Reducing storm water pollution makes the benefits of these water bodies more desirable.
2. **Enhanced Opportunities for Boating:** Reducing storm water runoff may, in turn, reduce the loading of sediment and/or other pollutant which could adversely impact water clarity. By protecting the water clarity, the program enhances the boating experience.
3. **Enhanced Recreational and Subsistence Fishing:** Pollutants in storm water can eliminate or decrease the numbers, or size, of sport fish and shell fish in receiving waters. Reducing pollutant concentrations in storm water can reverse these impacts.
4. **Reduced Flood Damage:** Storm water runoff controls may mitigate the potential for flood damage by incorporating controls to address the diversion of runoff, insufficient storage capacity, and reduced channel capacity from sedimentation.

¹ *Quality of Our Nation's Waters: Summary of the National Water Quality Inventory 2004 Report to Congress* - U.S. EPA EPA 841-R-08-001 - June 2009.

² Makepeace, D.K., D.W. Smith, and S.J. Stanley. 1995. Urban stormwater quality: summary of contaminant data. *Critical Reviews in Environmental Science and Technology* 25(2):93-139.

5. **Reduced Illness from Consuming Contaminated Fish:** Storm water controls may reduce the presence of pathogens in fish caught by recreational anglers.
6. **Reduced Illness from Swimming in Contaminated Water:** Epidemiological studies indicate that swimmers in water contaminated by storm water runoff are more likely to experience illness than those who swim farther away from a storm water outfall.
7. **Enhanced Opportunities for Non-contact Recreation:** Storm water controls reduce turbidity, odors, floating trash, and other pollutants, which then allow waters to be used as focal point for recreation, and enhance the experience of the users.
8. **Drinking Water Benefits:** Pollutants from storm water runoff, such as solids, toxic pollutants, and bacteria may pose additional costs for treatment, or render the water unusable for drinking.
9. **Water Storage Benefits:** The heavy load of solids deposited by storm water runoff can lead to rapid sedimentation of reservoirs and the loss of needed water storage capacity.
10. **Improved Habitat Benefits:** Storm water can have significant impacts to habitat and aquatic life. Storm water controls can minimize impacts to creek corridors and the wildlife dependent upon them.

IV. STATUTORY AND REGULATORY CONSIDERATIONS

The 1972 amendments to the federal Clean Water Act (CWA) prohibit the discharge of any pollutant to waters from a point source, unless a NPDES permit authorizes the discharge. The U.S. Congress amended the CWA in 1987, requiring the U.S. EPA to create phased NPDES requirements for storm water discharges.

In response to the 1987 Amendments to the CWA, the U.S. EPA developed Phase I of the NPDES Storm Water Program in 1990. Phase I requires NPDES permits for storm water discharges from: (i) "medium" and "large" MS4s generally serving, or located in incorporated places or counties with, populations of 100,000 or more people; and (ii) eleven categories of industrial activity (including construction activity that disturbs five acres or greater of land).

Phase II, adopted in December 1999 and became effective in March 2003, requires operators of small MS4s and small construction sites (construction activity disturbing greater than or equal to 1 acre of land or less than 1 acre if part of a larger common plan of development or sale) in urban areas to control storm water runoff discharges. Phase II establishes a cost-effective approach for reducing environmental harm caused by storm water discharges from previously unregulated small MS4s.

CWA Section 402(p)(3)(B) specifically requires that permits for discharges from MS4s must: (1) effectively prohibit the discharges of non-storm water to the MS4; and (2) require controls to reduce pollutants in discharges from MS4 to the maximum extent practicable (MEP) including best management practices, control techniques, system design and engineering methods, and such other provisions determined to be appropriate. Compliance with water quality standards is to be achieved over time, through an iterative approach requiring improved BMPs.

CWA Section 402(p)(3)(B)(ii) requires that permits for discharges from municipal storm sewers “shall include a requirement to effectively prohibit non-storm water discharges into the storm sewers.” The Central Valley Water Board’s *Water Quality Control Plan for the Tulare Lake Basin, Second Edition*, revised January 2004, also prohibits the discharge of waste to waters of the State in a manner causing, or threatening to cause a condition of pollution, contamination, or nuisance as defined in Water Code Section 13050.

Pursuant to the CWA, the U.S. EPA promulgated the MS4 Permit application regulations set forth in 40 CFR 122.26(d). These federal regulations describe in detail the permit application requirements for MS4s operators. Federal regulations at 40 CFR 122.26(d)(2)(iv)(B) also require MS4 operators, “to detect and remove illicit discharges and improper disposal into the storm sewer.” Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Permittees shall prevent all types of illicit discharges into the MS4 except for certain, specified non-storm water discharges.

The Permit requires the implementation of a comprehensive SWMP through a selection of BMPs [see 40 Code of Federal Regulations (CFR) 122.44(k)] as the mechanism to achieving the reduction of pollutants in storm water to the MEP [see CWA § 402(p)(3)(B)(iii)]. The information in the permit application (commonly called a Report of Waste Discharge) and the existing SWMP was utilized to develop the Permit conditions.

No numeric effluent limitations are proposed at this time. In accordance with 40 CFR 122.44(k), the U.S. EPA has required a series of increasingly more effective BMPs³, in the form of a comprehensive SWMP and performance standards, in lieu of numeric limitations.⁴

Additionally, on 14 November 2003, the California Superior Court ruled; “Water quality-based effluent limitations are not required for municipal Storm water discharges [33 USC §1342(p)(3)(B)] and [40 CFR §122.44(k)(3)]. For municipal storm water discharges, the permits must contain best management practices (BMPs), which reduce pollutants to the maximum extent practicable [33 USC §1342(p)(3)(B)]. These permits do contain these through the Storm Water Management Plan which is incorporated into the permits by

³ *Interpretative Policy Memorandum on Reapplication Requirements* of MS4s issued by U.S. EPA (61 Fed. Reg. 41697)

⁴ *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits* (61 Fed. Reg. 43761)

reference.” (*San Francisco Baykeeper vs. Regional Water Quality Control Board, San Francisco Bay Region*, Case No. 500527, 14 November 2003).

Subsequently, the State Water Resources Control Board (SWRCB) convened a Storm Water Panel (Blue Ribbon Panel) of experts to address the issue of numeric effluent limits.⁵ The study, finalized in June 2006, also concludes that it is not feasible at this time to set enforceable numeric effluent limits for storm water and non-storm water discharges from MS4s.

V. CITY OF BAKERSFIELD AND KERN COUNTY MS4

The unincorporated urbanized area within the County is defined as a medium municipality (population greater than 100,000 but less than 250,000) in Appendix I to Part 122 of Title 40 of the Federal Code of Regulations (40 CFR). As such, the County must obtain a NPDES municipal storm water permit for storm water discharges associated with its urbanized area. The City is also designated as a medium municipality in Appendix G of 40 CFR 122. Due to the interrelationship between the discharges of the County and City municipal storm sewers, the urbanized areas of Kern County in the vicinity of Bakersfield are designated as part of the medium municipal storm sewer. The County and City each have jurisdiction over about half of the Bakersfield metropolitan area. The City and County (Permittees) originally obtained coverage under WDR Order 94-164, NPDES Permit CA0083399, adopted on 24 June 1994 and are currently regulated by WDR Order 5-01-130, NPDES Permit CA0083399, adopted on 14 June 2001.

Storm Drain System

The area subject to this Order will be referred to as the Bakersfield Urbanized Area (shown in Attachment A) that for this Order, coincides with the Census Bureau 2010 Census Map. The County of Kern and City of Bakersfield own, operate, and maintain a storm drainage system serving metropolitan Bakersfield and a portion of the surrounding unincorporated area. The system includes approximately 2 to 3 miles of major storm drain open channels and approximately 40 miles of major closed conduit conveyances. Storm water runoff from the Bakersfield Urbanized Area is directed to either one of approximately 322 terminal retention basins or to one of 52 direct outfalls or 10 indirect outfalls (discharging after flowing through detention basins) discharging to the Kern River, East Side Canal, Carrier Canal, Stine Canal, or Kern Island Canal. The East Side Canal, Stine Canal, and Kern Island Canal are owned and operated by the Kern Delta Water District. The Carrier Canal is jointly owned by the City of Bakersfield and the Kern Delta Water District and operated by the City of Bakersfield. Approximately 90 percent of the average annual storm water runoff is retained in storm water detention basins. The Kern River and

⁵ Recommendations of the Blue Ribbon Panel were finalized as *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*, dated 19 June 2006.

the canals are considered waters of the United States or tributaries to waters of the United States. The Kern River and the canals are also waters of the State. Urban drainage watersheds that discharge to waters of the U.S. and State (shown in Attachment B) cover approximately 16,499 acres of the 88,576 acres within the Bakersfield Urbanized Area. Locations of outfalls that correspond with the drainage basin watersheds are listed in Attachment C.

There are portions within the Bakersfield Urbanized Area that are mainly agricultural, rural, and open space lands. It is not the intent of the federal storm water regulations to regulate storm water discharges from land uses of these types. Therefore, these areas are exempt from the requirements of this Order unless they are a point source discharge to the Permittees' conveyance system. Discharges from these sources may be subject to TMDL allocations and control programs.

Audits

The U.S. EPA Region 9 and the Central Valley Water Board conducted a program evaluation (2002 Evaluation) of the City of Bakersfield and the County of Kern's SWMP in November 2002, and U.S. EPA Region 9 conducted an inspection (2009 Inspection) of the City of Bakersfield's Construction Program in November 2009. The U.S. EPA Region 9 and PG Environmental conducted a program evaluation of the illicit discharge and construction components of the City and County programs in August 2012 (2012 Inspection). The purpose of the evaluation and inspections was to determine Permittees' compliance with WDR Order 5-01-130, and to review the overall effectiveness of the program with respect to U.S. EPA's storm water regulations.

During the 2002 Evaluation, the auditors found that the City and County were not adequately reviewing, tracking, or inspecting construction sites greater than 5 acres (now 1 acre) for erosion and sediment controls. The City and the County were not implementing BMPs at municipal facilities, and not conducting inspections at industrial facilities. In April 2003, the City responded to the 2002 Evaluation by submitting a Notice of Intent to obtain coverage under the Industrial General Permit for the City Corporation Yard and a soil and storm water characterization plan for the retention basin in the City Corporation Yard. On 1 October 2003, the City and County submitted proposed modifications to the SWMP to address the deficiencies noted in the 2002 Evaluation and submitted model SWPPPs for industrial and construction projects.

During the 2009 Inspection, the auditors found that the City was not ensuring that private and public construction projects were in compliance with local ordinances and the Construction General Permit per WDR Order 5-01-130, Provisions D.20, D.21, and D.22. The auditors found the City was not inspecting private construction projects, not requiring the submittal of SWPPPs or reviewing SWPPPs for private projects, not able to provide an inventory of active construction projects, and not issuing any enforcement actions against non-compliant project sites. Furthermore, the auditors found the City was not adequately conducting and documenting inspections of public projects. The City's lack of construction

program implementation was not adequately ensuring compliance with the City's local ordinances, the Construction General Permit, or WDR Order 5-01-130. On 2 September 2011, the City responded that the deficiencies noted in the 2009 Inspection, specific to certain projects, were corrected at the conclusion of the evaluation and new procedures were now being implemented for public projects: (1) The City stated it was in the process of training Construction Inspection and Engineering staff in order to obtain certifications as Qualified SWPPP Developers (QSD) and Qualified SWPPP Practitioners (QSP); (2) As now required under the Construction General Permit, the City is requiring contractors to prepare and submit a Storm Water Pollution Prevention Plan (SWPPP), which has been prepared by a QSD, for Capital Improvement Projects (CIP); (3) As the Legally Responsible Party, the City said it will approve and certify all CIP SWPPPs and ensure the SWPPPs are uploaded into the State of California Storm Water Multiple Application and Report Tracking System (SMARTS); (4) The City will require contractors to have a QSP on all CIP projects to perform all inspection, testing, and reporting; and (5) City construction inspection staff will monitor all qualifying CIP projects to ensure that the BMP's are maintained and that proper inspection and reporting work is being performed by the contractor.

Potential permit violations identified during the 2012 Inspection include failure of the City and County to facilitate a public reporting hotline or website, failure of the City and County to implement a storm drain stenciling program, failure of the City to provide written protocols for dry weather field screening and sampling, and failure of the City and County to ensure compliance with the Construction General Permit. The results of the 2012 Inspection were transmitted to the City and County on 1 May 2013. The County response indicated many of the potential violations had been corrected and additional deficiencies noted in the 2012 Inspection would be corrected by revisions to the City's and County's SWMP.

VI. ANTIDegradation

The State Water Resources Control Board adopted Resolution 68-16 ("Statement of Policy with Respect to Maintaining High Quality of Waters in California") (Antidegradation Policy), which requires the regional water boards to assure maintenance of the high quality of waters of the State unless it has been shown that: the degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives; the degradation will not unreasonably affect present and anticipated future beneficial uses; the discharger employs Best Practicable Treatment or Control (BPTC) to minimize degradation; and the degradation is consistent with the maximum benefit to the people of the state.

The communities covered by this Permit have continued to develop since adoption of the previous permit. Because future development will be required to implement the same level of water quality protection as the current program requires for existing development, the anticipated incremental growth over this permit term is not expected to cause significant impairment of receiving waters. The proposed Order allows storm water utility

service necessary to accommodate housing and economic expansion in the area, and is considered to be a benefit to the people of the State. Compliance with these requirements will result in the reduction of discharge pollutants from the urban areas to the MEP. Reducing pollutants in the discharge to MEP will result in an insignificant impact on existing water quality.

Receiving Water Quality

Since 1995, the Permittees have conducted dry weather and wet weather monitoring of the Kern River at the Rocky Point Weir and at the Calloway Weir in order to assess the impacts of urban discharge to the Kern River and submitted the monitoring results each year in their Annual Report. Receiving water monitoring data for the past six years are shown below. With one exception, the monitoring data generally shows no significant difference in concentrations of pollutants within the receiving water between the upstream and downstream monitoring stations indicating the MS4 discharge is not causing degradation and the results also generally show constituent concentrations also comply with water quality objectives. The high values for the Wet Weather Receiving Monitoring 2007-2008 downstream constituents appear to be misreported, as they are identical to the values reported for the spiked quality control samples reported on the laboratory data sheets for this monitoring event.

Wet Weather Receiving Water Monitoring

Metals (ug/L)	2011-2012		2010-2011		2009-2010		2008-2009		2007-2008		2006-2007	
	UP	DOWN										
Arsenic	3.4	2.9	3.7	4	5	5	5.7	5	4.2	52	3.3	4
Cadmium	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.053	0.12	<1.0	20	<1.0	<1.0
Chromium	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	19	<3.0	<3.0
Copper	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	46	<2.0	<2.0
Lead	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	50	<1.0	<1.0
Mercury	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nickel	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	45	<2.0	<2.0
Selenium	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	47	<2.0	<2.0
Zinc	<5.0	<5.0	7.1	<5.0	<5.0	<5.0	5.6	7.4	<5.0	50	<5.0	6
General Chemistry (mg/L)												
Calcium	18	17	15	15	19	17	18	18	18	18	15	16
Magnesium	3.3	3.3	2.7	3	3.5	3	3.1	3.3	3.1	3.3	2.8	3
Total Hardness, CaCO3	59	56	49	50	62	55	57	59	57	59	50	53
Total Dissolved Solids	100	96	97	93	140	840	130	130	130	130	87	79
Total Suspended Solids	14	26	6	3	<1.7	4	3.8	20	3.8	20	4.7	7

Ammonia as N	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.12	<0.1	0.1	<0.1	<0.1
Phosphorus	<0.05	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chemical Oxygen Demand	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25

Discharge Water Quality

In 1992, as part of its original permit application, the Permittees submitted a storm water discharge characterization plan that proposed sampling three drainage areas: the Mohawk Drive detention basin inlet as representative of commercial area discharge; the North Chester Avenue manhole access north of the Golden State Overpass representing industrial area discharge; and the Hawthorne Ravine at the intersection of Hawthorne Avenue and River Boulevard representing residential area discharge. The intent of the characterization plan was to characterize the storm water runoff from each of the three area types, then use the pollutant concentrations to estimate the total pollutant load from the entire Bakersfield Urbanized Area.

The following table provides the pollutant concentration results from the discharge characterization monitoring for the past five years for the residential, commercial and industrial representative areas:

Hawthorne- Residential Area

	2011-2012	2010-2011	2009-2010	2008-2009		2007-2008	2006-2007
				1st Storm	2nd Storm		
Metals (ug/L)							
Arsenic	5.4	6.4	4.6	<1.0	<1.0	3.9	5.3
Cadmium	<1.0	<1.0	<1.0	8.6	3.7	<1.0	<1.0
Chromium	6.2	3.3	3.5	0.23	0.31	3.9	<3.0
Copper	49	55	32	4.4	2.6	32	110
Lead	15	9.1	6.1	39	34	9.2	2.1
Mercury	<0.2	<0.2	<0.2	9.3	7.9	<0.2	<0.2
Nickel	7.1	8.1	5.8	8.7	5.1	6.5	2.6
Selenium	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	170	170	150	160	90	160	77
General Chemistry (mg/L)							
Calcium	8.5	22	11	15	12	13	58
Magnesium	1.9	3.5	1.9	2.6	1.4	2.5	4.9
Total Hardness, CaCO3	29	70	34	98	36	44	440
Total Dissolved Solids	61	170	96	78	82	120	9.3
Total Suspended Solids	160	76	43	48	31	96	160
Ammonia as N (Distilled)	<0.02	2.8	1.9	2.6	1.3	1.5	0.56
Total Phosphorus	0.64	0.99	0.65	0.71	0.054	0.69	0.46
Chemical Oxygen Demand	210	230	25	160	84	140	

North Chester- Industrial Area

<u>Metals (ug/L)</u>	2011-2012	2010-2011	2009-2010	2008-2009		2007-2008	2006-2007
				1st Storm	2nd Storm		
Arsenic	2.2	no flow	4.1	no flow	2.2	5.1	no flow
Cadmium	<1.0	no flow	<1.0	no flow	1.3	1	no flow
Chromium	4.5	no flow	7.3	no flow	3.8	5.7	no flow
Copper	21	no flow	35	no flow	22	32	no flow
Lead	11	no flow	18	no flow	7.2	12	no flow
Mercury	<0.2	no flow	<0.2	no flow	<0.2	<0.2	no flow
Nickel	4.5	no flow	9	no flow	5.2	7.3	no flow
Selenium	<1.0	no flow	<1.0	no flow	<1.0	<1.0	no flow
Zinc	270	no flow	640	no flow	380	650	no flow
<u>General Chemistry (mg/L)</u>							
Calcium	5.4	no flow	8.5	no flow	6.7	11	no flow
Magnesium	1.1	no flow	2.2	no flow	0.99	2.1	no flow
Total Hardness, CaCO3	18	no flow	30	no flow	89	36	no flow
Total Dissolved Solids	41	no flow	77	no flow	32	130	no flow
Total Suspended Solids	64	no flow	91	no flow	21	99	no flow
Ammonia as N (Distilled)	<0.02	no flow	1.6	no flow	2.4	1.8	no flow
Total Phosphorus	0.29	no flow	1.5	no flow	0.37	0.53	no flow
Chemical Oxygen Demand	87	no flow	120	no flow	68	96	no flow

Mohawk- Commercial Area

<u>Metals (ug/L)</u>	2011-2012	2010-2011	2009-2010	2008-2009		2007-2008	2006-2007
				1st Storm	2nd Storm		
Arsenic	2.3	1.2	6.4	1.9	2.6	1.7	<1.0
Cadmium	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chromium	3.9	<3.0	9.4	3	3.1	<3.0	<3.0
Copper	53	5.9	48	29	20	24	<2.0
Lead	6.3	<1.0	8.6	3.3	5	4.5	<1.0
Mercury	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nickel	4.3	<2.0	11	5.4	4.1	5.7	<2.0
Selenium	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	170	25	280	170	240	150	<5.0

	2011-2012	2010-2011	2009-2010	2008-2009	2007-2008	2006-2007	
General Chemistry (mg/L)							
Calcium	5.6	34	12	12	7.9	14	37
Magnesium	1.9	3	2.8	1.7	1.1	2.7	3.7
Total Hardness, CaCO ₃	22	97	41	37	24	47	110
Total Dissolved Solids	36	220	120	110	95	150	7
Total Suspended Solids	160	9.2	120	35	33	64	250
Ammonia as N (Distilled)	<0.02	0.5	2.2	2.8	1.2	1.6	0.15
Total Phosphorus	0.51	0.39	0.83	0.61		0.84	0.36
Chemical Oxygen Demand	150	44	270	130	82	160	<4.0

Receiving Water Limitations

Receiving Water Limitations are retained from previous MS4 permits and they reflect applicable water quality standards from the Basin Plan.

Impaired Water Bodies on the CWA 303(d) List

Section 303(d) of the CWA requires states to identify specific water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations on point sources. U.S. EPA approved the State's 2008-2010 303(d) list of impaired water bodies on November 12, 2010. Currently the Kern River below Kern River Powerhouse No. 1 is not listed as an impaired water body.

Total Maximum Daily Loads (TMDLs)

For all 303(d)-listed water bodies and pollutants, the Central Valley Water Board plans to develop and adopt TMDLs that will specify waste load allocations (WLAs) for point sources and load allocations (LAs) for non-point sources, as appropriate. No TMDLs currently apply to receiving waters within the Kern County/Bakersfield MS4, however, should the U.S. EPA or the Central Valley Water Board develop applicable TMDLs, this permit may be reopened to impose additional conditions that require additional control measures.

VII. STORM WATER MANAGEMENT PROGRAM

Federal regulations (40 CFR 122.26(d)(2)(iv)) provide that, "A proposed management program covers the duration of the permit. It shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The program shall also include a description of staff and equipment available to implement the program."

The Permittees have submitted a SWMP (dated June 2006 and submitted March 2007) describing the framework for management of storm water discharges during the term of this permit. The overall goals of the Permittees' SWMP are to a) reduce the degradation of waters of the State and waters of the United States (U.S.) by urban runoff and protect their beneficial uses, and b) develop and implement an effective SWMP that is well understood and broadly supported by regional stakeholders. The SWMP and modifications or revisions to the SWMP that are approved in accordance with this permit, are an integral and enforceable component of this Order.

The existing SWMP includes the following program components:

- Maintenance of Structural Controls
- Master Plan to Develop, Implement and Enforce Controls on New Development and Significant Redevelopment
- Operation and Maintenance of Roads, Streets and Highways
- Assessment of Existing and Proposed Flood Management Projects
- Controls for Landfills and Other Treatment, Storage or Disposal Facilities
- Controls for Pesticides, Herbicides and Fertilizer
- Leaking Sanitary Sewage Controls
- Spill Prevention, Containment, and Response Procedures
- Illegal Dumping Controls
- Storm Drain System Inspections and Control Measures
- Monitoring Program for Industrial Activities
- Site Planning Procedures
- Structural and Non-structural BMPs

The Permittees are required to modify and/or update the existing SWMP as necessary to address the requirements of the following core programs and submit to the Regional Water Board for review:

- Program Management
 - Legal Authority
 - Fiscal Analysis
- Core Programs
 - Construction Program
 - Planning and Development Program
 - Industrial and Commercial Program
 - Municipal Operations Program
 - Illicit/Illegal Discharge Program
 - Public Education and Outreach Program
- Program Effectiveness Assessment and Reporting

The core programs and the corresponding proposed Order requirements under those core programs are discussed below.

Program Management

This Order requires submission of an Annual Work Plan. The Annual Work Plan requires a description of the SWMP's and the Permittees' proposed activities for the upcoming fiscal year.

Pursuant to 40 CFR 122.42(c), this Order also requires submission of an Annual Report by 1 September of each year documenting the Permittees' status of implementing the SWMP; proposed changes to the SWMP programs; a summary of data accumulated throughout the year; documentation of the fiscal analysis discussed below; a summary of the number and nature of enforcement actions taken throughout the year; a summary of the number and nature of inspections conducted; identification of water quality improvements or degradation; and identification of the Permittees' status relative to the activities proposed in the previous year's Annual Work Plan. The Annual Report will also include a program effectiveness assessment and recommended modifications for each core program. Each Annual Report will build upon the previous year's efforts using and identifying BMPs to the MEP. The Annual Report will also include a compilation of deliverables and milestones completed during the previous 12-month period, as described in the SWMP and Annual Work Plan.

The Permittees are required to coordinate in order to ensure that all of the requirements outlined in this Order and the SWMP are implemented. To this end, the Permittees are required to review and if necessary, revise their existing memoranda of understanding (MOU) to ensure that it provides a suitable management structure and outline the roles and responsibilities for each Permittee. The Order also requires the Permittees to identify all departments responsible for water pollution control regulated activities and their roles and responsibilities under this Order. This information will be presented on an organizational chart submitted with the Annual Report.

The Program Management component of the SWMP requires the Permittees to evaluate existing training protocols and describe how the protocols will be changed to meet the requirements of the updated Permit.

Finally, the Permittees are required to secure the resources necessary to meet the requirements of this Order and prepare an annual fiscal summary as part of the SWMP Annual Report.

Construction Program

40 CFR 122.26(d)(i) requires the Permittees to implement a program to control the contributions of pollutants to the MS4 from storm water discharges associated with industrial activities. Construction sites of five acres or more are considered industrial activities. For smaller sites, 40 CFR 122.26 (d) (iv) (D), also requires a program to implement and maintain structural and non-structural best management practices at construction sites. This Order

requires the Permittees to update the SWMP to reduce pollutants in runoff from construction sites during all construction phases to the MEP. At a minimum, the Construction Program will ensure the following:

1. Identification of all active and inactive construction sites within their jurisdictions,
2. Prioritization of each site based on its threat to water quality,
3. Adding progressive enforcement, and
4. Reporting to the Central Valley Water Board of non-compliant sites.

Additionally, this Permit requires each Permittee to implement and enforce a program to control runoff from all construction sites subject to the State's *NPDES, General Permit For Storm Water Discharges Associated With Construction And Land Disturbance Activities, Order 2009-0009-DWQ, NPDES CAS000002* (General Construction Permit). The program will ensure:

1. Sediments are retained on-site by adequate source control BMPs;
2. Construction-related materials, wastes, spills, or residues are retained at the project site;
3. Non-storm water runoff from equipment and vehicle washing and any other activity is contained on-site;
4. Erosion from slopes and channels is controlled by effective BMPs;
5. Erosion and sediment control plans are secured prior to issuance of a grading permits;
6. All other environmental permits are obtained from agencies such as Department of Fish and Game, U.S. Army Corp of Engineers, and the Central Valley Water Board;
7. Construction sites within the MS4 permit boundaries are inspected for compliance with local ordinances and to confirm the Construction General Permit required SWPPP documents are on site; and
8. Sites in chronic noncompliance shall be reported to the Central Valley Water Board.

Based on the dual coverage and partnership approach between the permitting authority and municipalities that the U.S. EPA envisioned in the storm water regulations^{6,7} and to best use limited resources at the state and local levels, this Order requires the Permittees to implement the construction program provisions of the proposed Order and coordinate with the State Water Board's information system to avoid duplication and strengthen their inspections activities.

⁶ Letter dated December 19, 2000, from Alexis Strauss, Director, Water Division, U.S. EPA Region IX, to Dennis Dickerson, Executive Officer, Regional Water Quality Control Board-Los Angeles Region.

⁷ Letter dated April 30, 2001, from Alexis Strauss, Director, Water Division, U.S. EPA Region IX, to Honorable Stephen Horn, U.S. House of Representatives.

Industrial and Commercial Program

40 CFR 122.26(d)(2)(iv)(C) requires "A description of a program to monitor and control pollutants in storm water discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system. The program will:

1. Identify priorities and procedures for inspections and establishing and implementing control measures for such discharges;
2. Describe a monitoring program for storm water discharges associated with industrial facilities [...]"

Industrial awareness of the program may not be complete; there may be facilities within the MS4 area that should have coverage under the State Water Quality Order 97-03-DWQ, NPDES General Permit CAS000001, *Waste Discharge Requirements For Discharges Of Storm Water Associated With Industrial Activities, Excluding Construction Activities* (General Industrial Permit) but do not (non-filers). The Permittees shall continue to implement an industrial and commercial inspection and enforcement program to control the contribution of pollutants from industrial and commercial sites to the MS4.

In the preamble to the 1990 regulations, the U.S. EPA clearly states the intended strategy for discharges of storm water associated with industrial activity:

"Municipal operators of large and medium municipal separate storm sewer systems are responsible for obtaining system-wide or area permits for their system's discharges. These permits are expected to require that controls be placed on storm water discharges associated with industrial activity which discharge through the municipal system." The U.S. EPA also notes in the preamble *"municipalities will be required to meet the terms of their permits related to industrial dischargers."*

The U.S. EPA's Guidance Manual⁸ (Chapter 3.0) specifies that MS4 applicants must demonstrate that they possess adequate legal authority to:

- Control construction site and other industrial discharges to MS4s;
- Prohibit illicit discharges and control spills and dumping;
- Carry out inspection, surveillance, and monitoring procedures.

⁸ *Guidance Manual For the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems* - U.S. EPA -November 1992

The document goes on to explain that "*control*", in this context means not only to require disclosure of information, but also to *limit, discourage, or terminate* a storm water discharge to the MS4. Further, to satisfy its permit conditions, a municipality may need to impose additional requirements on discharges from permitted industrial facilities, as well as discharges from industrial facilities and construction sites *not* required to obtain permits.

The same Guidance Manual (Chapter 6.3.3) states that the municipality is ultimately responsible for discharges from its MS4. Consequently, the MS4 applicant must describe how the municipality will help the U.S. EPA and authorized NPDES States to:

- Identify priority industries discharging to its systems;
- Review and evaluate storm water pollution prevention plans (SWPPPs) and other procedures that industrial facilities must develop under general or individual permits;
- Establish and implement BMPs to reduce pollutants from these industrial facilities (or require industry to implement them); and
- Inspect and monitor industrial facilities discharging storm water to the municipal systems to ensure these facilities are in compliance with its NPDES storm water permit, if required.

Consistent with federal regulations and the above described guidance, this Order requires the Permittees to:

1. Review and update, if necessary, existing ordinances/standards/specifications to ensure they provide sufficient legal authority to implement the Industrial and Commercial Program,
2. Inventory and inspect industrial/commercial facilities within their jurisdiction and determine their compliance with local codes and ordinances, and
3. Coordinate with the state regarding the implementation of General Industrial Permit.

The goal is to control industrial and commercial sources identified as significant contributors of pollutants. The result should be a coordinated program with greater impact on limiting and eliminating (as a final goal) the contribution of pollutants to the receiving water. To achieve this goal, the Permittees to will be required to control the storm water discharges associated with industrial activities and other commercial facilities identified as significant contributors of pollutants; and assist the Central Valley Water Board in implementing the General Industrial Permit. The strategy, as outlined in this Permit, builds on the state/Permittee partnership by focusing their limited resources on the following activities:

- The Permittees will take a lead role in inspecting industrial and commercial facilities including, restaurants and automotive service facilities;
- The Central Valley Water Board will be the lead agency for inspections of facilities covered or in need of coverage under General Industrial Permit;
- The Permittees will assist the Central Valley Water Board in its activities to fully enforce the General Industrial Permit through spot check inspections, referrals, and/or joint inspections; and

- The Central Valley Water Board and Permittees will coordinate their information systems and task scheduling to avoid duplication and strengthen their inspections activities.

Studies indicate that facilities with paved surfaces subject to frequent motor vehicle traffic (such as parking lots and fast food restaurants), or facilities that perform vehicle repair, maintenance, or fueling (automotive service facilities) are potential sources of pollutants of concern in storm water. [References: Pitt et al., Urban Storm Water Toxic Pollutants: Assessment, Sources, and Treatability, Water Environment Res., 67, 260 (1995); Results of Retail Gas Outlet and Commercial Parking Lot Storm Water Runoff Study, Western States Petroleum Association and American Petroleum Institute, (1994); Action Plan Demonstration Project, Demonstration of Gasoline Fueling Station Best Management Practices, Final Report, County of Sacramento (1993); Source Characterization, R. Pitt, In Innovative Urban Wet-Weather Flow Management Systems (2000) Technomic Press, Field, R et al. editors; Characteristics of Parking Lot Runoff Produced by Simulated Rainfall, , L.L. Tiefenthaler et al. Technical Report 343, Southern California Coastal Water Research Project (2001)].

The Los Angeles and San Diego Regional Water Quality Control Boards have jointly prepared a Technical Report on the applicability of new development BMP design criteria for RGOs, [Retail Gasoline Outlets: New Development Design Standards for Mitigation of Storm Water Impacts, (June 2001)]. In March 1997, the California Storm Water Quality Task Force (SWQTF) published Best Management Practice Guide – Retail Gasoline Outlets.

State Water Board Order WQ 2000-11 directed the Los Angeles Regional Water Quality Control Board to mandate that RGOs employ the BMPs listed in SWQTF's March 1997 RGO BMP publication. Due to the potential threat to storm water quality from RGOs, Development Standards for RGOs are included in this Order.

During the 2002 Evaluation, auditors found that City and County were not conducting storm water inspections at industrial facilities. According to the evaluation response, since the 2002 Evaluation, the City's pretreatment inspection staff has been conducting storm water inspections at industrial facilities regulated by the City's pretreatment program. These include dry cleaners, radiator service facilities, animal care facilities, vehicle services, food services, mobile cleaning companies, and grease haulers.

This Order requires the Permittees to develop an inventory of all potential commercial and industrial sites/sources that could contribute pollutants to the MS4, at a minimum restaurants, automotive service facilities, retail gasoline outlets, and industrial facilities required by 40 CRF 122.26(b)(14) to be covered under the General Industrial Permit.

The inventory information will provide the Permittees with information on potential pollutant sources that contribute to the MS4 system, and the locations in the system into which they discharge. This information will also allow the Permittees to prioritize inspections and tailor education and outreach efforts to best assist the facility in implementing appropriate pollution

prevention practices or other on-site storm water controls. Additionally, the information contained in the inventory will enable Permittees to characterize these facilities and prioritize them based on their potential impact on storm water quality.

The Permittees are required to ensure that minimum control measures are implemented, as applicable, at every industrial/commercial facility included in its inventory. The controls required by the Permittees should be consistent with the General Industrial Permit.

Municipal Operations Program

Federal regulations [40 CFR 122.26(d)(2)(iv)(A)(1,3,4,5, and 6)] require that each Permittee must develop a program to reduce the discharge of pollutants from the MS4 to the MEP for all urban land uses and activities, including municipal areas and activities.

During the 2002 Evaluation, auditors found that the City's and County's corporation yards lacked adequate controls to prevent storm water contamination. In response to the evaluation, the City developed a Pollution Prevention Plan for its corporation yard and the County submitted a model SWPPP to be used to develop site specific best management practices for County facilities. In January 2011, the City implemented a Spill Prevention Control and Countermeasure Plan (SPCC) for the City's corporation yard.

Each Permittee is required to update and continue to implement a Municipal Operations Program to effectively prohibit non-storm water discharges and prevent or reduce pollutants in runoff from all municipal land use areas, facilities, and activities to the MEP. This is to include the development of standard operating procedures (SOPs) for inspection and maintenance of drainage facilities. Further, the Permittees are required to address discharges from the following activities:

1. Sanitary sewer overflow and spill response,
2. Municipal capital improvement projects,
3. Landscape and pest management,
4. Storm drain system maintenance,
5. Street cleaning and maintenance,
6. Parking facilities maintenance,
7. Detention basin construction and maintenance,
8. Public industrial activities management,
9. Emergency procedures, and
10. Non-emergency fire-fighting flows.

Illicit Connection/Illegal Discharge Program

Federal regulations [40 CFR 122.26(d)(2)(iv)(B)] state that the Permittees must implement a management program to detect and remove (or require dischargers to the municipal storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the MS4.

During dry weather, much of the discharge to storm drain systems consists of non-storm water sources. A portion of such discharges may be from illicit discharges or connections, or both. Illicit discharges may occur either through direct connections, such as deliberate or mistaken piping, or through indirect connections, such as dumping, spillage, subsurface infiltration, and washdown.

Each Permittee is required to update and continue to implement an Illicit Discharge Detection and Elimination Program to actively seek and eliminate illicit discharges and connections to the MEP. This is to include updating the existing training program for municipal staff.

Public Involvement and Education Program (Public Outreach Program)

Federal regulations [40 CFR 122.26(d)(2)(iv)(A)(6)] requires that the Permittees' management program include, "A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewer system associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities." These regulations [40 CFR 122.26(d)(2)(iv)(B)(6)] also provide that the proposed management program include, "A description of education activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials."

To satisfy the Public Outreach Program, the Permittees need to: (i) Implement a public education program to distribute educational materials to the community, or conduct equivalent outreach activities about the impacts of storm water discharges on local water bodies and the steps that can be taken to reduce storm water pollution; and (ii) Determine the appropriate BMPs and measurable goals for this minimum control measure.

Implementation of a Public Outreach Program is a critical BMP and a necessary component of a storm water management program. The State Board Technical Advisory Committee recognizes that education with an emphasis on pollution prevention is the fundamental basis for solving nonpoint source pollution problems. Furthermore, the public can provide valuable input and assistance to a municipal storm water management program and should play an active role in the development and implementation of the program. An active and involved community is essential to the success of a storm water management program.

The Order requires the Permittees to implement a Public Outreach Program using all media as appropriate to (1) measurably increase the knowledge of target communities regarding MS4s, impacts of urban runoff on receiving waters, and potential BMP solutions for the target audience; and (2) to change the behavior of target communities and thereby reduce pollutant releases to MS4s and the environment.

The current SWMP does not contain a separate program component for a Public Outreach Program. The Permittees will be required to revise the SWMP to include the Public Outreach Program as a separate core program in the SWMP. The purpose of the Public Outreach Program is to educate the public and encourage their participation in the implementation of the SWMP to the MEP. In addition, the Permittees will be required to incorporate a mechanism for **public participation** in the implementation of the SWMP (i.e., programs that engage the public in cleaning up creeks, removal of litter in river embankments, stenciling of storm drains, etc.).

Planning and Land Development Program

40 CFR 122.26 (d) (2) (iv) requires the Permittees program to include a comprehensive planning process to reduce the discharge of pollutants to the MEP using management practices, control techniques and system design, and design and engineering methods. The program must describe structural and source control measures.

On 5 October 2000, the State Water Board adopted Order WQ 2000-11⁹ concerning the use of Standard Urban Storm Water Mitigation Plans (SUSMPs) in municipal storm water permits for new developments and significant redevelopments by the private sector. The precedent setting decision largely sustained the LA Regional Board SUSMPs. The State Water Board amended the SUSMP to limit its application to discretionary projects as defined by California Environmental Quality Act (CEQA), eliminated the category for projects in environmentally sensitive areas, and set aside the requirement for retail gasoline outlets to treat storm water until a threshold is developed in the future. In addition, the State Water Board articulated its support for regional solutions and mitigation banking. The State Water Board recognized that the decision includes significant legal or policy determinations that are likely to recur (Gov. Code §11425.60). Due to the precedent setting nature of Order WQ 2000-11, this permit must be consistent with applicable portions of the State Water Board's decision and include SUSMPs.

Several of the MS4 permits for areas around the State contain or have given consideration to Standard Urban Storm Water Mitigation Plans (SUSMPs), also referred to as Development Standards, for specific categories of new development and redevelopment. In general, the SUSMPs require that 85 percent of the runoff from the subject sites be treated prior to discharge to surface waters or infiltrated and recommend or require other BMPs. The State Board has found that the provisions in the SUSMPs constitute MEP.

On 13 June 2002, the Permittees submitted a technical report comparing the existing SWMP and the SUSMPs, concluding that the SWMP requirements are comparable to SUSMPs. The SUSMP used by the Permittee for the comparison contained four options for numerical sizing criteria for structural BMPs (detention and retention basins). The City of Bakersfield requires that most new developments include retention basins designed to contain run-off

⁹ State Water Board Order WQ 2000-11: SUSMP; Memorandum from Chief Counsel to Regional Board Executive Officers, (December 26, 2000) discusses statewide policy implications of the decision.

produced by the 100-year, 24-hour storm event and capable of draining by percolation or evaporation within seven days. In cases where retention basins cannot be used, the City requires that developments include detention basins. Detention basins must be designed to detain the 100-year, 24-hour storm event. Kern County requires basins be sized to retain the Intermediate Storm Design Discharge 5-day storm event, which is equivalent to the 10-year, 24-hr storm times a factor of 1.44. The SUSMP criteria requires a basin that can infiltrate or treat the volume of annual runoff based on unit storage volume, to achieve 90% or more volume treatment by the method recommended in California Storm Water Best Management Practice Handbook- Industrial/Commercial (1993). The three methods, applied to a 1-acre drainage area with a 0.90 runoff coefficient requires a 0.135 acre-foot basin under the City of Bakersfield criteria, a 0.162 acre-foot basin under the Kern County criteria, and a 0.035 acre-foot basin under the SUSMP criteria. Both the City of Bakersfield and Kern County basin sizing criteria exceed the SUSMP criteria.

Approximately 90% of runoff from new development within the Bakersfield Urbanized Area is not discharged to waters of the U.S., but to terminal retention basins that are sized substantially above SUSMP criteria.

To ensure that the ever evolving standard of MEP is met, this Permit requires the Permittees to update the SWMP to ensure:

1. Continued maintenance of all storm water basins to maximize infiltration rates;
2. Continued maintenance of post-construction storm water controls not owned and operated by the Permittees by the implementation of transfer or maintenance agreements, as appropriate, and periodic inspections for all priority development projects;
3. Regular internal training is conducted on applicable components of the SWMP; and
4. Completion, as a part of the annual reporting process, of an annual assessment to determine the effectiveness of the program component and identify any necessary modifications.

VIII. MONITORING PROGRAM

Federal regulations (40 CFR 122.26(d)) require the following: (1) quantitative data from representative outfalls designated by the permitting authority, which shall designate between five and ten outfalls or field screening points as representative of the commercial, residential, and industrial land use activities of the drainage area contributing to the MS4; (2) estimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls and the event mean concentration of the cumulative discharges for constituents of concern; (3) estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of SWMP implementation; and (4) the Permittees to submit an annual report that identifies, among other things, water quality improvements or degradation. Items 1-3 were required as Part 2 of the initial application and were necessary for discharge characterization.

Wet Weather Monitoring

In December 1992, the Permittees submitted a wet weather discharge characterization plan proposing a monitoring program to collect data that could be used to determine total annual pollutant discharge loading. The discharge characterization plan was approved and incorporated into the monitoring and reporting program for WDR Order 94-164 and required annual reporting of monitoring data results to include an estimate of the annual pollutant load and comparison to previous years' estimates to evaluate the effectiveness of the SWMP. Monitoring and Reporting Program 5-01-130 required continuation of the wet weather discharge monitoring program from WDR Order 94-164.

Since 1992, the Permittees have monitored three drainage area locations: the Mohawk Drive detention basin inlet as representative of commercial area discharge; the North Chester Avenue manhole access north of the Golden State Overpass representing industrial area discharge; and at the Hawthorne Ravine at the intersection of Hawthorne Avenue and River Boulevard representing residential area discharge. The monitoring data from the representative areas has been used to calculate the Annual Storm Water Pollutant Load Estimation. The monitoring data will be further discussed later in this Fact Sheet

This Order carries over the wet weather monitoring in accordance with Monitoring and Reporting Program 5-01-130 until modifications to the Monitoring and Reporting Program have been approved by the Central Valley Water Board. Constituents to be monitored are carried over from WDR Order 5-01-130.

Receiving Water Monitoring

Receiving water is currently sampled in the Kern River once a year during dry weather and twice a year during storm events. The upstream receiving water sample is collected at Rocky Point Weir. The downstream receiving water sample is collected at the Calloway Headgate. Sample collection and analysis follows standard U.S. EPA protocol. Constituents to be monitored are carried over from WDR Order 94-164. The receiving water monitoring will be further discussed later in this Fact Sheet.

This Order requires the Permittees to continue to conduct receiving water monitoring in accordance with Monitoring and Reporting Program 5-01-130 until any modifications to the Monitoring and Reporting Program have been approved by the Central Valley Water Board. Constituents to be monitored are carried over from WDR Order 5-01-130.

Dry Weather Field Screening

The Permittees conduct dry weather field screening at all surface water outfalls each year between mid-August and mid-October. Outfalls with sufficient flow are monitored in the field per Section II.D. of the MRP 2013-xxxx for temperature, pH, phenols, chlorine, total copper, specific conductance, methyl blue activated substances, and turbidity, with follow-up

investigation for discharges exceeding action levels to determine presence of illicit connections.

Special Studies

Copper and Zinc Investigation and Reduction Plan

The Permittees are required to develop a Copper and Zinc Plan to evaluate the extent and causes of copper and zinc in their storm water discharge and implement management actions to eliminate or reduce sources of copper and zinc. These pollutants were determined to be pollutants of concern based upon monitoring that was conducted between 2007 and 2012. Analysis of the discharge characterization monitoring data submitted by the Permittees (shown below) shows copper and zinc concentrations being discharged at levels that may require additional management activities and observation to ensure they do not negatively impact water quality.

Chester Site	2007-08	2008-09		2009-10	2010-11	2011-12
Constituent	Storm 1	Storm 1	Storm 2	Storm 1	Storm 1	Storm 1
Total Copper(ug/L)	32.0	NR	22.0	35.0	NR	21.0
Total Zinc(ug/L)	650	NR	380	640	NR	270
Hardness(mg/L)	36	NR	21	30	NR	18

Mohawk Site	2007-08	2008-09		2009-10	2010-11	2011-12
Constituent	Storm 1	Storm 1	Storm 2	Storm 1	Storm 1	Storm 1
Total Copper(ug/L)	24.0	29.0	20.0	48.0	5.90	53.0
Total Zinc(ug/L)	150	170	240	280	25	170
Hardness(mg/L)	47	37	24	41	97	22

Hawthorne Site	2007-08	2008-09		2009-10	2010-11	2011-12
Constituent	Storm 1	Storm 1	Storm 2	Storm 1	Storm 1	Storm 1
Total Copper(ug/L)	32.0	39.0	34.0	32.0	55.0	49.0
Total Zinc(ug/L)	160	160	90	150	170	170
Hardness(mg/L)	44	48	36	34	70	29

Copper and zinc have water quality criteria that are dependent on the hardness values of the water (effluent or receiving water depending on the water body). For comparison, these are the benchmark monitoring values for copper and zinc in the EPA *Final National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit for Stormwater Discharges From Industrial Activities (MSGP)* that became effective 29 September 2009:

Water Hardness Range	Copper (ug/L)	Zinc (ug/L)
0-25 mg/L	3.8	40
25-50 mg/L	5.6	50
50-75 mg/L	9.0	80
75-100 mg/L	12.3	110

100-125 mg/L	15.6	130
125-150 mg/L	18.9	160
150-175 mg/L	22.1	180
175-200 mg/L	25.3	200
200-225 mg/L	28.5	230
225-250 mg/L	31.6	250
250+ mg/L	33.2	260

These are the values which U.S. EPA uses to determine if a storm water discharge from an industrial facility needs additional best management practices for storm water treatment. While the benchmark values are not a part of this Order, the copper and zinc concentrations in the discharge characterization sampling usually exceed the benchmark values.

As an additional point of reference, the California Toxics Rule criteria for copper, acute (1-hour average) and chronic (4-day average) are 3.2 µg/L and 2.4 µg/L, respectively, as total recoverable; and for zinc, chronic criterion (maximum four-day average concentration) and the applicable acute criterion (maximum one-hour average concentration) are both 31.9 µg/L, as total recoverable. These criteria are not directly applicable to urban storm water runoff, but can be used as an indicator that further examination of these pollutants may be warranted.

Monitoring Program and Monitoring Data Assessment Methodology

The Permittees have annually submitted a report entitled *Annual Stormwater Pollutant Load Estimation* containing the annual pollutant load calculation. This estimation is calculated using the annual average pollutant concentration from the compiled storm water monitoring record (1993-2012) and 30-year average annual precipitation (1970-1999). The Permittees have not been using the data to identify trends in pollutant concentration or to evaluate the effectiveness of their SWMP. In order to determine if the water quality is improving or declining from year to year, the annual pollution concentrations and annual pollutant loads should be compared to identify trends that may be related to implementation of the SWMP. Due to the low annual rainfall (less than 6 inches/ annual average) and seasonal variability in the quantity of rainfall in the Bakersfield Area, comparison of annual pollutant loads and/or pollutant concentrations may not be an indication of SWMP effectiveness.

Central Valley Water Board staff reviewed the current receiving water monitoring program and determined that it does not adequately assess impact to the Kern River because the monitoring locations are not located upstream and downstream of all storm water outfalls to the Kern River. Drainage area 12 discharges upstream from Rocky Point Weir and drainage areas 4.1, 4.2, 4.3, 7, 9, and 11 discharge below the Calloway Weir. Only drainage areas 1, 6, 6.1, and 6.2 discharge between the upstream and downstream monitoring points. No receiving water monitoring has been conducted within any of the canals that receive storm water discharge.

The Order requires the Permittees to assess the current monitoring and data analysis methodology and propose modifications that will provide a better assessment of the effectiveness of the SWMP.

Program Effectiveness Assessment

This Order requires the Permittees to provide an analysis of the effectiveness of their SWMP in their Annual Reports. The Order requires the assessment to identify the direct and indirect measurements that the Permittees use to track the effectiveness of their programs as well as the outcome levels at which the assessment is occurring consistent with the proposed Order. Direct and indirect measurements shall include, but not limited to, conformance with established performance standards, quantitative monitoring to assess the effectiveness of program components, measurements or estimates of pollutant load reductions or increases from identified sources, raising awareness of the public, and/or detailed accounting/documentation of SWMP accomplishments.

- a. The Permittees will be required to track the long-term progress of their SWMP towards achieving improvements in receiving water quality.
- b. The Permittees will be required to use the information gained from the program effectiveness assessment to improve their SWMPs and identify new BMPs, or modification of existing BMPs. This information shall be reported within the Annual Reports consistent with this Order.
- c. Long Term Effectiveness Assessment (LTEA) Strategy: The Permittees will collaborate to develop a LTEA strategy, which shall build on the results of the Annual Reports and the initial program effectiveness assessments. The LTEA is required to be submitted to the Regional Water Board no later than 180 days prior to the permit expiration date (**by [insert date]**) and shall identify how the Permittees will conduct a more comprehensive effectiveness assessment of the storm water program as part of the SWMP.

The strategy will address the storm water program in terms of achieving both programmatic goals (raising awareness, changing behavior) and environmental goals (reducing pollutant discharges, improving environmental conditions).