HARBOR TOXICS TMDL MONITORING AND REPORTING PLAN (MRP)

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Prepared for:

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September 11, 2018

LOS ANGELES REFINERY - WILMINGTON OPERATIONS

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LOS ANGELES REFINERY - WILMINTON OPERATIONS
MRP REVISION HISTORY

Revision No.	Date	Revised By	Reason for Revision	Sections Revised
1.0	5/29/18	Ana Horn, QISP WGR Southwest, Inc.	Initial **DRAFT** preparation to address Harbor Toxics TMDL Monitoring Plan provisions as required by Order No. R4-2017-0095	All
2.0	8/14/18	Ana Horn, QISP WGR Southwest, Inc.	Revised **DRAFT** plan in accordance with Regional Board comments	4.1, 4.2, 4.3, 6.0, Figure 1, Figure 3

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LOS ANGELES REFINERY - WILMINGTON OPERATIONS

MRP DISTRIBUTION

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1.0 Introduction

This document constitutes the proposed Harbor Toxics Total Maximum Daily Load (TMDL) Water Column, Sediment and Fish Tissue Monitoring and Reporting Plan (MRP) for the Los Angeles Refinery, Wilmington Operations (herein facility). The facility is located at 2101 E. Pacific Coast Highway, Wilmington, CA. The MRP was developed to comply with the Harbor Toxics TMDL Monitoring Program as required in the National Pollutant Discharge Elimination System (NPDES) Permit No. CA0003778, amended by Order No. R4-2017-0095.

The principal objectives of this MRP are to:

- Assess the chemical, physical and biological impacts of discharges from the facility to the receiving water: the Dominguez Channel Estuary,
- Characterize pollutant loads in facility discharges,
- Identify and evaluate pollutant sources, and
- Measure and improve the effectiveness of pollutant controls.

This MRP follows the *"TMDL Element – Monitoring Plan"* provisions in Attachment A to Resolution No. R11-008. Applicable water quality objectives for the TMDL are narrative objectives for Chemical Constituents, Bioaccumulation, Pesticides, and Toxicity in the Basin Plan and the numeric water quality criteria promulgated in 40 CFR Section 131.38 (the California Toxics Rule (CTR)). In addition, sediment condition objectives were determined using the State Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (SQO-Part 1) and the sediment quality guidelines.

The facility's proposed compliance TMDL monitoring program is required to be submitted to the Regional Water Board Executive Officer for public comment and approval. All monitoring as specified in this MRP shall be triggered by the first discharge from the facility to the permitted NPDES outfall. *If no discharge occurs, implementation of this monitoring and reporting plan is not required* (See Section 4.0).

2.0 Facility Information

The facility processes approximately 100,000 barrels per day of crude oil, primarily from California production sources. Crude oil is delivered to the facility via pipeline and marine vessels. The crude oil is converted into a full range of petroleum products, including various grades of automotive and aviation gasoline, jet fuels, diesel fuels, bunker fuels, and petroleum coke. Recovered byproducts include liquefied petroleum gas (LPG), coke and sulfur. Finished products such as gasoline and distillate fuels, and by-products such as residual fuel oil and petroleum coke are exported from the facility via pipeline, marine vessels, trucks, and rail cars; other materials, such as LPG, are exported using rail cars and trucks. The facility has a maximum crude and product storage capacity of approximately 5.6 million barrels. Processes at the facility include desalting, atmospheric distillation, vacuum distillation, fluid catalytic cracking, hydrocracking, delayed coking, hydrotreating, alkylation, catalytic reforming, hydrogen generation, isomerization, and sulfur recovery.

The facility receives commingled storm water and wastewater from the Sulfur Recovery Plant, a facility owned by the Wilmington Refinery, located about 1.3 miles north of the

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facility. Commingled storm water and wastewater from the Sulfur Recovery Plant is received via pipeline, where it is routed to the facility's treatment system and subsequently discharged to the Los Angeles County Sanitation Districts under Industrial Wastewater Discharge Permit No. 20098.

2.1 Facility Treatment and Controls

Wastewater (commingled storm water and process water) generated at the facility is collected and /or treated by three separate systems:

1. High Chemical Oxygen Demand (HCOD) Treatment System

   Wastewater from the processing unit systems and crude clearing waters are treated in the HCOD treatment system. The HCOD system consist of a pretreatment unit, corrugated plate interceptors, induced gas floatation units, sour water strippers, a dissolved air floatation unit and flow equalization tanks. Effluent from the HCOD treatment system is combined with effluent from the low chemical oxygen demand system and discharged to the Los Angeles County Sanitation District, under Industrial Wastewater Discharge Permit No. 20098.

2. Low Chemical Oxygen Demand (LCOD) Treatment System

   The LCOD treatment system receives wastewater originating from boiler blowdown, cooling tower blowdown, miscellaneous wastewater (including miscellaneous cleanup wastewater, petroleum coke-belt wash waters, excess coke drums cutting and quench waters, hydrostatic test waters, fire system test wastewater and water softener regeneration wastewaters), sulfur recovery plant wastewater, drainage from the truck loading area, and storm water from the facility.

   Drainage areas south of the Pacific Coast Highway is routed to lamella separator number 3 and drainage areas north of the Pacific Coast Highway are routed to lamella separator number 6. Both lamella separator number 3 and number 6 drain to storage Tank Number 15001. Wastewater in Tank Number 15001 is treated by two induced gas floatation units and then routed to the LCOD system Effluent Tank Number 15002. The LCOD system effluent is subsequently transferred to the Tank 25013, where it is combined with the treated effluent from the HCOD system and transferred to Tank 80043. Effluent in Tank 80043 is subsequently discharged to the sanitary sewer.

   During emergency situations, effluent from the lamella separators may be discharged to the Dominguez Channel Estuary through Discharge Point 003. Effluent discharge through Discharge Point 003 is manually controlled by a valve that is normally closed and chain locked to prevent unauthorized discharges.

3. Segregated Storm Water System

   Storm water collected in the tank farms from the north and west sections of the facility consist of non-commingled storm water that remains segregated from other sources of refinery wastewater and storm water. Non-commingled storm water from the north tank farm can be routed by gravity to a collection sump, which discharges to Tank No. 80009. Storm water from the northwest and west tank farms are routed to

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oil/water separators #7 and #8. Storm water in these separators is subsequently discharged to Pond No. 2, where it is routed to the LCOD system or Tank 80009.

Storm water collected in Tank 80009 is normally routed to the LCOD system and subsequently discharged to the sanitary sewer. During emergency conditions effluent collected in Tank 80009 can be discharged into the Dominguez Channel Estuary through Discharge Point 001.

2.2 Facility Discharge

The facility has a combined storm water storage capacity of 31 million gallons. Under normal conditions, treated wastewater (commingled process water and storm water) and non-commingled storm water is preferentially routed to the LACSD sewer connection.

Under NPDES No. CA0003778, storm water can be released into the Dominguez Channel Estuary through the permitted Discharge Point 001 and/or Discharge Point 003 if flooding of the facility is imminent after taking all reasonable operational steps to contain excess wastewater (i.e. - reaching all on-site storage capacity and the capacity to discharge to the LACSD) and if there are risks to human life, the safety of employees and the community from flooding of the facility.

If a discharge to the Dominguez Channel Estuary occurs, effluent samples are required to be collected during active discharge at the corresponding discharge location (i.e. – Discharge Point 001 and/or Discharge Point 003) for the parameters listed in the permit order. During years of discharge, the receiving water is required to be monitored at monitoring location RSW-001 and bed sediment is required to be monitored at monitoring location SED-001 for the parameters specified in the permit order. In addition, the first discharge through the permitted NPDES outfalls would also trigger the implementation of the Harbor Toxics TMDL Monitoring Program as specified in this MRP.

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3.0 MRP Implementation Team

The following table lists the facility's MRP implementation team members along with their area(s) of responsibility. The implementation team is responsible for ensuring required monitoring and sampling are being performed as detailed in the MRP, as well as ensuring applicable deadlines are being met. The table below is subject to change due to personnel and responsibility.

Table 3.0: MRP Implementation Team

Name	Title	Responsibility
Dave Foster	Vice President	Certification of associated monitoring reports submitted to the LARWQCB.
Robert Nguyen	Environmental Manager	Overall Storm Water Program implementation at the Facility. Approval of facility effluent discharges. Responsible for BMP implementation, employee training and spill response.
On - Duty Facility Operators	Facility Operators	Controls the release of storm water, coordinates storm water related maintenance issues.
WGR Southwest Inc.	Environmental Consultant	Preparation of reports and plans, conducts annual evaluation and provides technical assistance to the facility personnel for storm water compliance issues
Qualified Sampling Contractor	Sampling Supervisor / Technicians	Collects samples as required by the facility's MRP, completes required field documentation, prepares samples for submittal to laboratory
Eurofins Laboratory	Contracted Laboratories	Analyzes samples and provide detailed laboratory reports of results, and QA/QC data

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3.1 Site Maps

Table 3.1 lists the figures incorporated as attachments depicting the facility's location, permitted storm water outfall and drainage, and the monitoring stations to be sampled under this MRP.

Table 3.1- Site Maps

Map Description	Map Name	Figure No.
At least one quarter mile vicinity around the facility, shows nearby bodies of water	TOPOGRAPHIC VICINITY MAP	Figure 1
Facility flow schematic of wastewater and storm water streams	WILMINGTON REFINERY FLOW DIAGRAM	Figure 2
Sampling stations established in accordance with Attachment A to Resolution No. R11 – 008	MONITORING STATIONS	Figure 3 & Figure 4

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4.0 Monitoring and Reporting Plan

Under NPDES Permit No. CA0003778, the Wilmington Refinery is required to conduct Harbor Toxics TMDL water column, sediment and fish tissue monitoring in the Dominguez Channel Estuary. Monitoring, as specified in this MRP, is only to be implemented when a discharge occurs to the permitted NPDES outfalls. *If no discharge occurs, implementation of this monitoring and reporting plan is not required.* The facility's permitted NPDES outfalls are designated to be used for emergency purposes only. Storm water and wastewater is preferentially routed to the facility's POTW sewer connection.

If a single discharge occurs to the permitted NPDES outfalls, the first storm water discharge shall trigger the beginning of the monitoring year for the Harbor Toxics TMDL program. All monitoring as outlined in this MRP shall be implemented from the facility's first discharge after the effective date of the permit order. The monitoring year shall begin the day the first discharge from the facility is released and shall conclude one year thereafter.

The Quality Assurance Project Plan (QAPP) supporting this MRP specifies the sample collection protocols, standard analytical procedures, quality assurance / quality control protocols for water, sediment and fish tissue monitoring. The QAPP includes Surface Water Ambient Monitoring Program (SWAMP) methods and procedures to be incorporated in the Harbor Toxics TMDL Monitoring Program. Table 4.1 describes the stations to be monitored under this MRP, along with the sample media and applicable analytical parameters. Compliance with waste load and load allocations shall be addressed as part of the Annual Report submitted to the Los Angeles Regional Water Quality Control Board (LARWQCB).

The LARWQCB Executive Officer may reduce, increase or modify monitoring and reporting requirements, as necessary, based on the results of the TMDL monitoring program. Several of the constituents of concern have numeric targets that are lower than the readily available detection limits. As analytical methods and detection limits continue to improve and become more environmentally relevant, associated responsible parties may be requested by the Executive Officer to incorporate new method detection limits in the MRP and QAPP. Water column, sediment and fish tissue monitoring requirements are described in Section 4.1, Section 4.2, and Section 4.3.

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4.1 MRP Implementation Schedule

This MRP is required to be submitted to the LARWQCB within 12 months of the effective date of the permit order for public comment and the Regional Water Board approval. The facility shall initiate monitoring 6 months after the MRP and QAPP are approved by the LARWQCB Executive Officer, unless otherwise directed by the Executive Officer.

Implementation of this MRP, is as follows:

- If *no discharge occurs*, the MRP shall not be implemented.
- If *a single discharge occurs,* all monitoring as outlined under this MRP shall be implemented from the facility's first discharge after the effective date of the permit order. Receiving water column sampling (including water samples and total suspended (TSS) samples) shall begin during or as soon as possible following the first effluent discharge event. Sediment and fish tissue monitoring must begin within the year of the first effluent discharge event.

Once implementations of the MRP is triggered, sufficient water samples shall be collected to analyze for the required constituents. As specified in Attachment A to Resolution No. R11-008, water column and total suspended solids (TSS) samples shall be collected at the outlet of the storm drains discharging to the Dominguez Channel Estuary; sediment samples and fish tissue samples shall be collected within the Dominguez Channel Estuary. Table 4.1 below provides a summary of the established monitoring stations.

Table 4.1 – Monitoring Stations

Water Body Name	Station ID	Station	Station Location	Sample Media and Parameters[1]
Dominguez Channel Estuary	01	Discharge Point 001 Station	33 ° 47'33.45" N 118 13'48.88" W	**Water Column / TSS:** Lead, Zinc, Copper, PCBs, DDT, benzo[a]anthracene, benzo[a]pyrene, chrysene, phenanthrene, and pyrene, temperature, dissolved oxygen, pH, electrical conductivity and receiving water flow
	03	Discharge Point 003 Station	33 ° 47'08.39" N 118 14'05.95" W	**Water Column / TSS:** Lead, Zinc, Copper, PCBs, DDT, benzo[a]anthracene, benzo[a]pyrene, chrysene, phenanthrene, and pyrene, temperature, dissolved oxygen, pH, electrical conductivity and receiving water flow **Sediment:** Sediment Chemistry[2], Toxicity, Benthic Community Effect
	04	Fish Tissue Sampling Station[3]	33 ° 46'40.94" N 118 ° 14'24.01" W	**Fish Tissue:** Chlordane, Dieldrin Toxaphene, DDT and PCBs

1 – Sampling shall be designed to collect sufficient volumes of suspended solids to allow for analysis of the listed pollutants in the bulk sediment.

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2 – Sediment bed samples shall only be collected at Station 03. Sediment chemistry samples shall be analyzed for the full chemical suite as included in Attachment A of the SQO-Part 1.
3 – Fish tissue sampling location is subject to change depending on sampling conditions. If no fish are available within the Estuary during a sampling event, the sampling location may be moved downstream to a location in close proximity to the Estuary (i.e. – northeast end of consolidated slip)

4.2 Water Column Monitoring

Water column monitoring shall be performed at Station 01 and Station 03 for the parameters listed in Table 4.1. Water samples and TSS samples shall be collected during two wet weather events and one dry weather event each year. TSS samples shall be collected at several depths (i.e. – surface, mid-water column, and bottom).

The first large storm event of the season, once MRP implementation has been triggered, shall be included as one of the wet weather monitoring events. Receiving water column sampling (including water samples and total suspended solids (TSS) samples) shall begin during or as soon as possible following the first effluent discharge event. During water column sampling, sufficient volumes of suspended solids shall be collected to allow for analysis of the pollutants in the bulk sediment. TSS samples collected at different depths shall be consolidated and analyzed as one sample for each station. Water and TSS samples shall be analyzed for lead, zinc, copper, DDT, PCBs, benzo[a]anthracene, benzo[a]pyrene, chrysene, phenanthrene and pyrene at Station 01 and 03. General water chemistry including temperature, dissolved oxygen, pH, electrical conductivity and receiving water flow shall be monitored at Station 01 and 03 during each sampling event using the appropriate field instrumentation for measurement. All samples are to be submitted to a state certified laboratory for analysis with an accompanying chain of custody as specified in the supporting QAPP.

Table 4.2 summarizes the waste load allocations (WLAs) as included in the Harbor Toxics TMDL for the Dominguez Channel Estuary.

Table 4.2 – Dominguez Channel Estuary Water Column Concentrations Based WLAs

Lead (ug/L)	Zinc (ug/L)	Copper (ug/L)	PAHs[1] (ug/L)	Chlordane (ug/L)	Dieldrin (ug/L)	4'4 - DDT (ug/L)	Total PCBs (ug/L)
8.52	85.6	3.73	0.049	0.00059	0.00014	0.00059	0.00017

1 – CTR human health criteria were not established for total PAHs. Therefore, the CTR criterion for individual PAHs of 0.049 ug/L is applied individually to benzo(a)anthracene, benzo(a)pyrene, and chrysene. The CTR criterion for Pyrene of 11,000 ug/L is assigned as an individual WLA to Pyrene. Other PAH compounds in the CTR shall be screened as part of the TMDL monitoring.

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4.3 Sediment Monitoring

Sediment triad sampling shall be performed at Station 03 every five years starting from the year of the first effluent discharge event and every five years subsequently. Sediment triad sampling, as specified in the SQO - Part 1, consists of three lines of evidence (LOE) including: sediment chemistry, two toxicity tests and four benthic indices. See Section 4.3.1 – 4.3.4 for a description of the required LOEs.

In addition, sediment chemistry sampling shall be conducted in between the sediment triad sampling events every five years (ideally halfway between the five-year sampling period for the sediment triad sampling). The sediment chemistry samples shall be analyzed for the full chemical suite as included in Attachment A of the SQO-Part 1 to evaluate trends in general sediment quality constituents and listed constituents relative to sediment quality targets. Chemistry data without accompanying sediment triad data shall be used to assess sediment chemistry trends and shall not be used to determine compliance. If possible, the sediment quality objective evaluation as detailed in the SQO - Part 1, shall be performed every five years in coordination with the Biological Baseline and Bight regional monitoring programs[1].

If moderate sediment toxicity is observed, results shall be reported in the Annual Report and submitted to the LARWQCB. Further analysis and evaluation to determine the causes of toxicity and remedial actions shall be performed in accordance with the Executive Officer's approved monitoring plan. Table 4.3 presents marine sediment targets applicable to the Dominguez Channel Estuary.

Table 4.3 – Marine Sediment Targets

Organics	Marine Sediment Target (ug/kg)	Metals	Marine Sediment Target (mg/kg)
Chlordane, total	0.5	Cadmium	1.2
Dieldrin	0.02	Copper	34
Total PCBs	22.7	Lead	46.7
Benzo[a]anthracene	261	Mercury	0.15
Benzo[a]pyrene	430	Zinc	150
Chrysene	384		
Pyrene	665		
2-methlnapththalene	201		
Dibenz[a,h] anthracene	260		
Phenanthrene	240		
Total PAHs	4022		
Total DDT	1.58		

[1] Biological Baseline and Bight regional monitoring programs are coordinated by the Southern California Coastal Water Research Project. Regional sediment quality monitoring occurs once every three years.

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Sampling guidelines for assessing sediment composition and benthic community effects shall be performed in the Dominguez Channel Estuary following the guidelines specified in Section VII.E of the SQO Part 1.

Compliance with sediment TMDLs may be demonstrated by achieving the qualitative sediment condition of *unimpacted* or *likely unimpacted* via the interpretation and integration of Multiple Lines of Evidence (MLOE) as defined in the SQO-Part 1. Assessment of sediment quality shall consist of measuring and integrating data gathered from three lines of evidence (LOE) including sediment chemistry analysis, sediment toxicity and benthic community condition. Each LOE is described in the following sections.

4.3.1 Sediment Chemistry LOE

Sediment chemistry measures the concentration of chemicals in surface sediments and is used to assess the potential risk posed to benthic organisms from toxic pollutants. Sediment chemistry analysis is only intended to evaluate overall exposure risk from chemical pollutants. Two indices are used to interpret the results: the California Logistic Regression Model (CA LRM) and the Chemical Score Index (CSI). Results obtained from both indices are subsequently used to produce a single score representing the chemistry LOE.

4.3.2 Sediment Toxicity LOE

Sediment toxicity measures the response of invertebrates exposed to surface sediment under controlled laboratory conditions. Toxicity results are used to assess pollutant related biological effects and exposure and provides a measurement of exposure to all pollutants present, including non-traditional or unmeasured chemicals.

The toxicity LOE requires a short-term survival test and a sublethal test. The results of each test are categorized into nontoxic, low toxicity, moderate toxicity or high toxicity and are assigned a corresponding score. The two test scores are integrated to produce a single score for the sediment toxicity LOE.

4.3.3 Benthic Community Condition LOE

Benthic community effect measures the species composition, abundance and diversity of sediment dwelling invertebrates inhabiting surface sediments. Benthic community condition is used to assess impacts on benthic fauna and is intended to only evaluate overall exposure risk from chemical pollutants. The benthic condition is assessed using the following indices:

- Benthic response index (BRI)
- Index of Biotic Integrity (IBI)
- Relative Benthic Index (RBI)
- River Invertebrate Prediction and Classification System (RIVPACS)

The indices are analyzed together to provide an overall score for the benthic community condition LOE.

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4.3.4 Integration of Multiple LOE

Assessment as to whether the aquatic life sediment quality objective has been attained at a monitoring station is accomplished by the interpretation and integration of MLOE. Evaluating both the chemistry and toxicity LOE determines the potential for chemically mediated effects. Similarly, evaluating both the toxicity and benthic community LOEs determines the severity of biological effects. Each LOE combination allows for the classification of each monitoring station into the following categories: unimpacted, likely impacted, possibly impacted, likely impacted, clearly impacted, or inconclusive.

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4.4 Fish Tissue Monitoring

Fish tissue samples shall be collected every two years from the Dominguez Channel Estuary at Station 04. If no fish are available within the Estuary during a sampling event, the sampling location may be moved downstream to a location in close proximity to the Estuary (i.e. – northeast end of consolidated slip). Fish tissue samples shall be analyzed for chlordane, dieldrin, toxaphene, DDT and PCBs. Target species shall be selected based on residency, local abundance and fish size at the time of field collection. Tissues analyzed shall be based on the most common preparation for the selected fish species.

Selected fish species shall be collected by specialized contractors with the appropriate equipment to capture and prepare the fish tissue for analysis. Sampling locations are subject to change depending on field conditions during sampling events. Fish tissue samples shall be analyzed by Eurofins Laboratory. See QAPP Section 11.3 for a detailed description of fish species selection and procedures.

The fish tissue targets and the associated sediment targets for each pollutant, as specified in the Harbor Toxics TMDL, are summarized in Table 4.4. Fish tissue targets were determined from *Fish Contaminant Goals and Advisory Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium and Toxaphene* developed by the Office of Environmental Health Hazard Assessment OEHHA (2008).[2]

Table 4.4 – Fish Tissue Targets and Associated Sediment Targets

Pollutant	Fish Tissue Targets (ug/kg wet)	Associated Sediment Target (ug/kg dry)
Chlordane	5.6	1.3
Dieldrin	0.46	n/a
Toxaphene	6.1	0.1
Total DDT	21	1.9
Total PCBs	3.6	3.2

Compliance with bio-accumulative TMDLs in fish tissue may be demonstrated via any of the following:

a. Fish tissue targets are met in species residents to the TMDL waterbodies.

b. Final sediment allocations based on sediment-fish tissue linkage in the Harbor Toxics TMDL are met.

c. Sediment numeric targets to protect fish tissue are met in bed sediments over a 3-year averaging period.

[2] The Office of Environmental Health Hazard Assessment OEHHA (2008) assists agencies in developing fish tissue-based criteria for pollution mitigation or elimination and to protect humans from consumption of contaminated fish.

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d. Demonstrate that the sediment quality condition protective of fish tissue is achieved per the Statewide Enclosed Bays and Estuaries Plan.

5.0 Sampling Procedures

Sample collection protocols, standard analytical procedures, quality assurance / quality control protocols for water and sediment monitoring are specified in the QAPP supporting this MRP.

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6.0 Reporting Requirements

An Annual Report shall be submitted to the LARWQCB indicating compliance with waste load and/or load allocations. The annual monitoring report shall include the following:

- A description of monitoring activities conducted for the monitoring year;
- A summary of water, sediment and tissue analytical results;
- A summary of any deviations from the proposed sampling program and associated quality assurance / quality control issues and any associated action / response activities; and
- A summary of compliance / non-compliance with waste load allocations / targets.

Implementation of the Harbor Toxics TMDL monitoring program is triggered by the first storm water discharge from the facility through the permitted NPDES outfall into the Dominguez Channel Estuary. The monitoring year shall begin the day the first discharge from the facility is released and shall conclude one year thereafter. The Annual Report shall be submitted to the LARWQCB starting 15 months after monitoring is initiated and annually in subsequent years. All receiving water monitoring data shall also be submitted in accordance with the California Environmental Data Exchange Network (CEDEN). The facility shall submit all receiving water monitoring data in accordance with CEDEN, when feasible.

If no discharge occurs implementation of the TMDL monitoring program is not required and, as such, a no discharge report shall be submitted in the Annual Report submitted to the LARWQCB.

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HARBOR TOXICS TMDL QUALITY ASSURANCE PROJECT PLAN (QAPP)

DRAFT

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September 11, 2018

LOS ANGELES REFINERY – WILMINGTON OPERATIONS

QAPP REVISION HISTORY

Revision No.	Date	Revised By	Reason for Revision	Sections Revised
1.0	5/28/18	Ana Horn, QISP WGR Southwest, Inc.	Initial **DRAFT** QAPP preparation	All
2.0	8/14/2018	Ana Horn, QISP WGR Southwest, Inc.	Revised **DRAFT** plan in accordance with Regional Board comments	6.0, 6.1, 6.2, 9.0, 11.1, 12.3, 13.1, Appendix A, Appendix B, Appendix C and Appendix D

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1.0 Title and Approval Sheets

Quality Assurance Project Plan approvals:

Name	Title	Signature	Date
Dave Foster	Vice President		9/5/2018
Robert Nguyen	Environmental Manager		9-5-18
Amber Ballrot	Water Compliance Specialist		9-5-18
Ana Horn	Environmental Compliance Technician WGR, Southwest Inc.	Ana Horn	9-5-18

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Appendix C Harbor Toxics TMDL Targets
Appendix D Chain of Custody
Appendix E Field Monitoring Forms
Appendix F Surface Water Ambient Monitoring Program (SWAMP) Collection of Water and Bed Sediment Samples
Appendix G State Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (SQO – Part 1)
Appendix H Attachment A to Resolution No. R11-008

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3.0 Distribution List

Copy No.	Distribution Location
1	Los Angeles Refinery – Wilmington Operations
2	WGR Southwest Inc. – Los Alamitos Office
3	Qualified Sampling Contractor

4.0 Project / Task Organization

As required by National Pollutant Discharge Elimination System (NPDES) No. CA0003778, Order R4-2017-0095, the Los Angeles Refinery – Wilmington Operations (herein facility) has developed a Quality Assurance Project Plan (QAPP) to support the facility's Monitoring and Reporting Plan (MRP) for the Harbor Toxics Total Maximum Daily Load (TMDL) Monitoring Program. The QAPP outlines monitoring and sampling methods, standard analytical procedures, laboratory certification requirements and quality assurance / quality control protocols. The QAPP consists of the following key elements:

1. Program Management;
2. Field sampling data quality objectives;
3. Laboratory quality objectives; and
4. Data review, verification and validation.

The goal of this QAPP is to ensure high quality data collection that allows for comparability to accurately define the existing conditions of the facility's receiving water.

4.1 Involved Parties and Roles

Facility officials, and qualified trained contractors undertake a collaborative approach to implement all aspects of this QAPP. The following outlines the involved parties, their tasks and responsibilities in implementing this program.

- Dave Foster is the Vice President of the organization who reviews and certifies all associated reports required to be submitted to the Los Angeles Regional Water Quality Control Board (LARWQCB) for the Harbor Toxics TMDL monitoring program. The vice president of the organization will not participate in the day to day execution of the program.
- Robert Nguyen is the Environmental Manager in charge of overseeing the storm water program implementation at the facility and approving facility effluent discharges to the NPDES outfall. The facility manager reviews field sampling activities, including sampling protocols followed by the designated sampling contractors, to ensure all sampling procedures comply with the facility's QAPP. The facility manager may stop all actions if there are significant deviations from required practices, or if there is evidence of systemic failure.

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- WGR Southwest Inc. is the facility's Environmental Consultant that assists with reporting, plan preparation and provides technical assistance to facility personnel for storm water compliance issues. The environmental consultant is responsible for managing changes and updates to the facility's QAPP after a review of gathered data is assessed and all involved parties meet to discuss findings, deficiencies and any necessary changes applicable to the plan. Additionally, the environmental consultant is responsible for compiling field observations and analytical data from laboratories into a database, reviewing of the data for completeness and consistency.
- A select contractor shall be assigned to conduct field sampling for the facility's TMDL program. The contracted samplers shall be required to assign a designated supervisor to provide monitoring oversight in the field, provide progress reports to facility management and ensure all field sampling equipment is properly maintained. Contracted samplers are responsible for sample collection; handling and transport; and, field data transmittal to responsible parties.
- Contracted laboratories are responsible for delivering sample confirmation receipt notifications to facility management, performing the required analytical methods, following documentation, custody and sample logbook procedures, meeting all reporting QA / QC requirements, delivering electronic data files to facility management and meeting turnaround times for required analyses.

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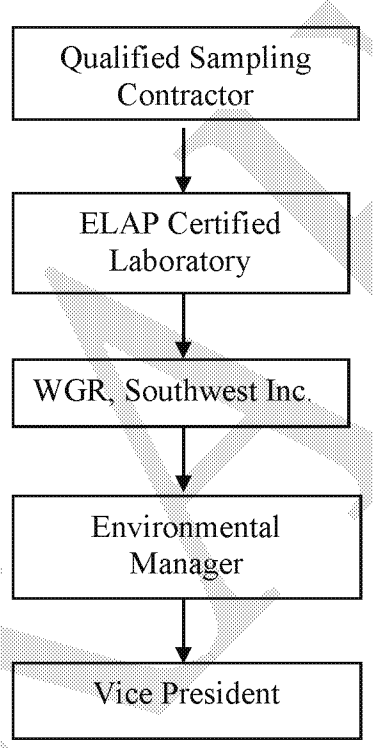
4.2 Project Organizational Chart

The facility's MRP and QAPP shall be distributed to involved parties including the Environmental Manager, Environmental Consultant and Sampling Contractor. The sampling contractor is responsible for collecting samples and following the corresponding procedures outlined in the facility's QAPP. Samples shall be submitted to a certified laboratory. Analytical results shall then be distributed to the Environmental Manager, and Environmental Consultant for review to account for any deficiencies, if any. Based on the information gathered, a monitoring report shall be generated and given to the Vice President for review and sign off to submit to the corresponding agency. The organizational chart below provides a summary of this pathway of information below:



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5.0 Problem Statement / Background

The Clean Water Act Section 303(d) identifies impaired waterbodies for which effluent limitations are not meeting water quality standards. Water quality standards include the designated beneficial uses of a waterbody, the adopted water quality objectives to protect those uses, and the State's Antidegradation Policy. The 303(d) list identifies the Dominguez Channel Estuary as an impaired water body that fails to fully support its designated beneficial uses. The Dominguez Channel Estuary contains pollutant impairments for a variety of toxic pollutants, including metals, organic compounds and sediment toxicity; these impairments exist in the water column, sediment and/or fish tissue.

To protect and restore fish tissue, water and sediment quality, TMDLs for the Dominguez Channel Estuary have been designed to limit the amount of pollutants entering harbor waters. Target loads are specified in the TMDL program with the intent to determine the quantity of contaminants a system can assimilate while protecting water quality. Additionally, the TMDL strives to identify contaminant source inputs and linkages of inputs to impairments and allocate reductions to each pollutant source to achieve compliance with established targets for the restoration and protection of harbor waters.

The Wilmington Refinery is an individual industrial permittee allowed to discharge storm water into the Dominguez Channel Estuary under NPDES Permit No. CA0003778, Order No. R4-2017-0095. As such, the facility is required to develop a TMDL monitoring program to assess and characterize the pollutants present in the facility's receiving water.

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6.0 Project Task Description

Data gained from water column, sediment and fish tissue samples in the Dominguez Channel Estuary shall be reported to the LARWQCB at the end of each monitoring year.

In addition, the facility shall utilize the analytical data to identify areas where waste load and/or load allocations are not being met, including identifying stressors and evaluating appropriate targets. Sampling shall occur at monitoring Stations 01, 03 and 04 as described in the facility's MRP and depicted in Figure 3, and Figure 4. The information gathered from the facility's TMDL monitoring program may be used by regulatory agencies to identify management actions that can be implemented to reduce sources and improve water quality as well as to plan for future monitoring needs and regulatory actions.

Monitoring shall include obtaining samples using Surface Water Ambient Monitoring Program (SWAMP) protocols and following the Sediment Quality Objectives (SQO) - Part 1 guidelines. Samples shall be collected by a qualified contractor specialized in sample field collection. Eurofins laboratory shall be used as the contract laboratory for analysis required under the Harbor Toxics TMDL Program. Eurofins Laboratory is an accredited laboratory with Environmental Laboratory Accreditation Program (ELAP) Certification No. 2944. As needed, Eurofins Laboratory shall subcontract to laboratories certified in accordance with the provision of Water Code Section 13176. ELAP certified analytical laboratories shall incorporate the corresponding QA/QC data to the analytical laboratory report. Pollutants must be analyzed using the analytical methods prescribed in 40 Code of Federal Regulations (CFR) 136.

6.1 Implementation Schedule

Implementation of the facility's MRP and QAPP shall begin from the facility's first discharge through the permitted NPDES outfall. Receiving water column sampling (including water samples and TSS samples) shall begin during or as soon as possible following the first effluent discharge event. Sediment and fish tissue monitoring must begin within the year of the first effluent discharge event. If *no discharge occurs, no monitoring shall be conducted in the Dominguez Channel Estuary and implementation of the facility's QAPP is not required.*

Monitoring shall include obtaining water column / TSS samples at Station 01 and 03, sediment samples at Station 03 only and fish tissue samples at Station 04. To assess temperature, dissolved oxygen, pH, electrical conductivity and receiving water flow, an appropriate calibrated field instrument shall be used by trained sampling personnel.

Table 6.1 summarizes water column, sediment and fish tissue requirements. Refer to Figure 3 and Figure 4 for the facility's monitoring stations.

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Table 6.1 – Monitoring Requirements		
Medium	**Monitored Constituents**	**Frequency**
Water Column / TSS	Flow, Temperature, Dissolved Oxygen, pH, Electrical Conductivity, Lead, Zinc, Copper, DDT, PCBs, benzo[a]pyrene, benzo[a]anthracene, chrysene, phenanthrene, and pyrene.	3 Times / Year during: Two wet weather events[1] & One dry weather event
Sediment	Sediment chemistry, Two Sediment Toxicity Tests, and Four Benthic Indices	Every 5 Years[2]
Fish Tissue	Chlordane, Dieldrin, Toxaphene, DDT and PCBs	Every 2 Years

1 - The first large storm event of the season, once monitoring is triggered by a discharge from the facility, shall be included as one of the wet weather monitoring events. If no discharge occurs from the facility, implementation of the MRP and QAPP are not required.

2 - Sediment triad sampling shall be conducted every five years (starting from the year of the first effluent discharge event and every five years subsequently). Sediment chemistry shall include the constituents listed in Attachment A of the SQO-Part 1. Sediment triad sampling and sediment chemistry sampling shall occur at Station 03 only. In addition, sediment chemistry sampling shall be conducted in between the sediment triad sampling events every five years (ideally halfway between the five-year sampling period for the sediment triad sampling)

All field sampling and measurements shall be conducted as outlined in the SWAMP Standard Operating Procedure for the *Collection of Water and Bed Sediment Samples with Associated Field Measurements and Physical Habitat in California* (Appendix F) and SQO-Part 1 (Appendix G) sediment sampling procedures. Additional details about sample collection, handling and laboratory procedures are provided in QAPP, Section 12.

6.2 Deliverables

The facility's proposed MRP and QAPP plans are the first deliverables to the LARWQCB. Once approved and monitoring is initiated, monitoring reports shall be submitted to the LARWQCB annually. The first report is due 15 months after monitoring begins, and subsequent reports shall be submitted annually thereafter. If there is no discharge triggering the implementation of the facility's MRP and QAPP, no discharge shall be specified in the Annual Report.

Annual monitoring reports shall include a description of monitoring activities conducted for the monitoring year, a summary of water, sediment and fish tissue analytical results, summary of any deviations from the proposed sampling program and associated QA/QC issues, and any associated action/response activities. Annual monitoring reports shall provide a statement assessing whether or not monitoring results indicate compliance or non-compliance with waste load allocations / targets.

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7.0 Quality Objectives and Criteria for Data Measurement

Data acquisition activities shall include both field measurements and laboratory analyses. The following indicators shall be used to assess data quality: accuracy, precision, representativeness, comparability and completeness. These indicators and data quality objectives shall be used to determine the level of error considered to be acceptable in the data produced by the sampling program. The following provides a brief discussion of the objectives for the indicators used in this monitoring program.

7.1 *Accuracy (Bias)*

Accuracy is a measurement of how closely analytical results correspond to a "true" or accepted value. To achieve accuracy in measurements of pH, dissolved oxygen, electrical conductivity, and temperature, the corresponding measurement device shall be calibrated before each sampling event. Additionally, the laboratory is to address accuracy during sample analysis by evaluating the percent recovery of surrogates, laboratory control samples (LCS) and / or matrix spikes (MS).

7.2 *Precision*

Precision is a measurement of how closely analytical results can be duplicated. Precision is addressed by the collection and analysis of replicate samples. Additionally, the laboratory duplicates shall be analyzed to assess laboratory precision, which is reported as a standard deviation or relative percent difference (RPD).

7.3 *Representativeness*

Representativeness describes the degree to which the results of analyses represents the samples collected and the samples representation of the environment from which they are taken. Determining appropriate sample locations, utilizing approved documents and standard operating procedures and analytical methods shall ensure that field conditions are represented as best as possible. It is important to note that because site conditions may be affected by flow, tidal cycles, weather conditions, etc. field observations and conditions shall be noted during each sampling event.

7.4 *Comparability*

Comparability is the similarity of data from different sources. To appropriately compare data from multiple sampling events, standard methods of sample handling and analysis must be used. Maintaining consistency in the standard methods used eliminates variables that might result in unusable data.

7.5 *Completeness*

Completeness is the percentage data available for use compared to the potential amount of data identified in the monitoring plan. Ideally, 100% of the data should be available, however, possibilities exist for issues to arise that may result in incomplete data sets. These include unexpected field conditions, laboratory error, and shipment complications that result in unacceptable sample preservation conditions. To minimize data loss, facility management shall review all collection protocols and field measurements and implement corrective actions, if needed.

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8.0 Special Training / Certification

Sampling personnel shall have prior experience and training in the type of water quality monitoring proposed for this program. The designated contract sampling supervisor shall ensure personnel are trained and familiar with the facility's MRP and QAPP.

Contracted laboratories must be certified by the Environmental Laboratory Accreditations Program (ELAP) in accordance with provision of Water Code Section 13176. The assigned laboratory shall have their own QA/QC program in place to ensure requisite knowledge and skills are in place for the proper execution of the analytical methods being requested.

Involved parties responsible for implementation of this QAPP shall ensure all necessary standard operating procedures are followed for the duration of the program. All involved parties must completely understand the QAPP and retain an up to date copy for reference.

9.0 Documentation and Records

Records of all monitoring information, including calibration and maintenance records, copies of all reports and records of all data shall be maintained for a minimum of three (3) years.

All field measurements shall be recorded at the time of completion using standard field data sheets. The data sheets shall be reviewed at each monitoring station to ensure all information required is complete. If data is missing an explanation must be recorded documenting the reason for incompleteness. The following information shall be recorded at each monitoring station:

- Monitoring station ID / location
- The date and time of sample collection
- Name of individuals collecting the samples
- Field observations / site conditions
- GPS coordinates
- Field measurements
- Number and types of samples collected
- Additional information that may affect the integrity of the samples

Laboratory personnel are responsible for documenting all analyses performed. Reporting shall include:

- The date(s) analyses were performed;
- The analytical techniques or methods used;
- The results of such analysis;
- Names of the personnel who performed the analysis;
- Final laboratory analytical reports;

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- Analytical and extraction methods;
- Summary of QA/QC data, including matrix spikes, laboratory control samples, duplicate analyses, blanks, blank spikes, percent recovery of surrogates, etc. (Level 2 QA/QC); and,
- A perjury statement executed by the person responsible for the laboratory.

Analytical results received from the laboratory shall be reported to the LARWQCB. An Annual Report on the findings of the monitoring program shall be developed and submitted at the end of the monitoring year.

All of the above information shall be reviewed by qualified personnel to ensure that proper analytical methods and procedures were followed. The information shall be reviewed, specifically, to determine if the samples were analyzed using the proper analytical methods and within the appropriate holding times, and if the QA/QC data is within allowable limits set by the laboratory. All QA/QC items must be run on the same dates the samples were actually analyzed. Duplicate and spike samples shall be analyzed at the frequency specified in the applicable analytical method; if the method does not specify a frequency, duplicate samples and spike samples shall be analyzed at a frequency of 5% (1 in 20 samples) with at least one if there are fewer than 20 samples in a batch. A batch is defined as a single analytical run encompassing no more than 24 hours from start to finish.

Each sample result must specify the applicable reporting limit (RL) and the Method Detection Limit (MDL) for each parameter, as determined by the procedure in 40 CFR Part 136. If there are any discrepancies in the laboratory data, the laboratory shall be contacted to discuss the discrepancies. An explanation for the discrepancies should be included in the annual report. In addition, the QAPP shall be reviewed and revised annually based on the results and execution of the program during the reporting year. Revisions shall be made by the facility's environmental consultant and the changes shall be reviewed and approved by the facility manager. An updated copy of the plan shall be redistributed to the parties involved in the execution of the facility's QAPP.

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