CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
CUP CONDITION H5 ANNUAL COMPLIANCE REPORT

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

EXECUTIVE SUMMARY

This Annual Compliance Report (Report) provides an update on Chevron's compliance with the conditions of approval and mitigation measures adopted as part of the Chevron Richmond Modernization Project (Project) for 2022. This report is made up of this narrative summary and 13 attachments, including: Attachment 1 – CUP Compliance Table; Attachment 2 – MMRP Compliance Table; Attachment 7 – Annual Reliability Program Report, which provides detailed information concerning Chevron's implementation of the Project Reliability Program; and Attachment 9 – Annual Operations Emissions Summary, which provides detailed information concerning the Project's compliance with the Project-related emissions limits. The remaining attachments provide information required pursuant to specific conditions or mitigation measures.

Chevron commenced Project construction in June 2016 and accomplished significant milestones for the Project in 2019 by completing primary construction of the new hydrogen plant and sulfur removal improvements and placing those improvements into service. In 2022 Chevron completed secondary construction activities required under the Project's CUP and MMRP. This construction activity included the tank doming of T-3189 and the GHG Construction Mitigation Project, which commenced construction in February and May of 2021 respectively. Both secondary project components were completed and became operational in 1Q2022.

With the start of Project operation in 2019, the Chevron Richmond Refinery (Refinery) became subject to additional compliance requirements specific to Project operations, including, but not limited to, Project-related emissions limits and implementation of the Reliability Program. As discussed in detail below, the Refinery achieved its emissions commitments of no net increase (NNI) in criteria air pollutants (CAPs), no net increase in health risk from toxic air contaminants (TACs), and no physical increase (NPI) in greenhouse gas (GHG) for the 2022 operational year. Further, the Refinery has fully implemented and is in compliance with its Reliability Program, which has been subject to extensive pre- and post- start-up reviews by Contra Costa Health Services (CCHS). The most recent CCHS review was completed in September 2022. The Refinery continues to operate in compliance with its Title V permit, which incorporates the Project requirements.

Since approval and commencement of construction, the Project has also:

- Invested, to date $76 million dollars towards funding the Community GHG Reduction Program, the Richmond Promise Scholarship Program, and additional City programs pursuant to the Environmental and Community Investment Agreement (ECIA).

- Completed construction on the GHG Mitigation project which replaced 4 diesel driven pumps with four electric 4 pumps. This will decrease GHG emissions by more than 339 MT CO2e/year, thus providing additional emission reduction benefits beyond mitigation of the one-time, construction-related exceedance of the GHG threshold of significance.

- Completed construction and placed into service tank domes on T-3225, T-3202, and T-3189, which will reduce organic compound emissions.

- Entered into a lease with MCE Clean Energy (MCE) pursuant to which MCE has developed a 10.5-megawatt solar project on Chevron property. The MCE Solar One project has been completed and the facility is currently operating.

- Put into service two newly constructed Suez Max ships and one newly constructed tug-boat consistent with the project design features included as part of the Project, the effect of which is to lower emissions associated with shipping activity at the Chevron Long Wharf.

- Upgraded 17 piping circuits and four partial piping circuits and valves to 9-Chrome as part of its 2017 No. 4 Crude Unit turnaround, as committed to in and implemented by the Chevron Modernization Project Reliability Program approved as part of the Project.

- Coordinated with the City for a survey of local Richmond roadways to assess repairs needed for roadways frequently traveled for Project support.

Commensurate with the requirements of the CUP and MMRP, Chevron has decommissioned the old hydrogen plant and, in 2022, continued to progress plans to dismantle the structure. Project modifications for the Fluid Catalytic Cracker (FCC) Feed Hydrotreater (FHT) have yet to be constructed.

Chevron continues to work with the City of Richmond and other agencies to implement and monitor the requirements of the conditional use permit, mitigation monitoring and reporting program, Air District Permit Conditions, and Chevron Richmond Reliability Program. Chevron provides the City with regular reports on its implementation of the Project-related requirements, including updates on both construction-related and operation-related mitigation measures.

BACKGROUND

On July 29, 2014, the City of Richmond approved Conditional Use Permit and Design Review Permit No. PLN11-089 (CUP) authorizing construction and operation of the Project. On February 11, 2015, the Bay Area Air Quality Management District (District) reissued Authority to Construct (ATC) No. 12842 authorizing the same. In approving the CUP and the ATC, the City and the District relied upon the Final Environmental Impact Report (EIR) certified by the City on July 29, 2014, inclusive of the MMRP adopted by the City to mitigate Project-related impacts to less than significant. The EIR analyzed, and the CUP and ATC approved, the Reduced Sulfur Processing/No Increase in Refinery Greenhouse Gas Emissions Alternative, generally referred to as Alternative 11. Alternative 11 includes construction of a new hydrogen plant, various so-called sulfur removal improvements (including modifications to the Refinery's existing sulfur recovery units (SRUs)), and related infrastructure and tie-ins, and requires the Refinery to achieve NNI in CAPs and health risks from TACs, and NPI in GHG emissions.

On April 3, 2015, the Contra Costa Superior Court discharged the writ of administrative mandamus issued in 2009 concerning the prior version of the Project. Starting in second quarter 2015, Chevron began the process for obtaining internal project approval and funding. Once

obtained, Chevron undertook a competitive bidding process to identify and select engineering and construction firms to implement the Project. Once those selections were made, Chevron undertook updates to all of its design engineering drawings to ensure compliance with the Project approvals.

This report is submitted pursuant to CUP condition, H5, which provides:

> "On or before March 31 of each year beginning after the first full year of Project construction, Chevron shall submit to the City both an annual compliance report, and payment of an amount sufficient to cover staff costs (including time) associated with the compliance review, documenting compliance with the conditions of approval of this Conditional Use Permit and the mitigation measures and improvement measures as shown in the Mitigation Monitoring and Reporting Program, and to cover costs and fees (including time) of third party experts retained by the City pursuant to any mitigation measure of the Project or condition of approval. Chevron shall submit payments to the County and BAAQMD for their respective costs (including County and BAAQMD staff time, and time, costs, and fees of third-party experts retained by the County pursuant to any mitigation measure of the Project), in accordance with a payment schedule determined by the County and BAAQMD. Following the first compliance report and payment from Chevron, and prior to March 31 of the next year, the City shall provide Chevron on an annual basis an accounting of the City's expenditure of the compliance review payment, which at a minimum shall include the City staff who worked on the compliance review, the time spent, and a general description of the work performed. The annual compliance reports shall contain supporting information from other regulatory agencies, as applicable. For each condition and mitigation measure, the report shall identify the status of compliance, times and dates of the monitoring and whether further action is required. The Planning Commission will hold hearings at a frequency of once each year to review Chevron's compliance with the conditions of approval of this Conditional Use Permit, including compliance with the mitigation measures and improvement measures. If, in the opinion of the Planning Commission, Chevron has completed all mitigation measures and improvement measures, and has complied with all conditions of approval, no further reports shall be necessary. The Planning and Building Services Department shall notify Chevron in writing when the Planning Commission has determined that annual reports will no longer be necessary pursuant to this Condition."

PROJECT CONSTRUCTION

In 2022 Chevron completed secondary construction activities required under the Project's CUP and MMRP. This construction activity includes the tank doming of T-3189 and the GHG Construction Mitigation Project, which commenced construction in February and May of 2021, respectively. Both secondary project components were completed and became operational in 1Q2022. Detailed information concerning Chevron's implementation of and compliance with the various construction-related conditions of approval and mitigation measures is included Attachment 1-CUP Compliance Table and Attachment 2-MMRP Compliance Table, as well as

Attachment 3 – 2022 Quarterly Construction Questionnaires and Attachment 9 – 2022 Quarterly Construction Emissions Reports.

During construction activities, Chevron ensured compliance with all applicable requirements in the CUP and MMRP, which also includes tracking construction-related emissions against thresholds of significance established by the Air District. In May 2019, Chevron proposed a GHG project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-11 (GHG Mitigation Project) and subsequently worked with the City to finalize details and gain concurrence from the City. Construction of the GHG Mitigation Project was completed and became operational in 1Q2022.

Chevron has decommissioned and is continuing to progress plans to dismantle the structure. Project modifications for the Fluid Catalytic Cracker (FCC) Feed Hydrotreater (FHT) have yet to be constructed.

PROJECT OPERATIONS

The Project commenced operations on April 17, 2019, which coincided with the end of commissioning at the new hydrogen plant pursuant to the ATC. As such, the Refinery became subject to additional requirements specific to Project operations. The Project has complied with all of its CUP and MMRP requirements. Detailed information concerning Chevron's implementation of and compliance with the various operations-related conditions of approval and mitigation measures is included in Attachment 1 – CUP Compliance Table and Attachment 2 – MMRP Compliance Table, as well as Attachment 7 – Annual Reliability Program Report and Attachment 9 – Annual Operations Emissions Summary.

Pursuant to the City's approval of Alternative 11, the Refinery must achieve NNI in CAPs, NNI in health risks from TACs, and NPI in GHG emissions over the Baseline emissions established for the Project. As described in Attachment 9, Chevron worked with the City and City's environmental consultant, Ramboll, to develop the Operations Emissions Tracking Tool (OETT), which is a tool that calculates emissions of CAPs and TACs from the Refinery, as well as shipping and transportation activities, and compares those emissions to the Baseline established in the EIR. The OETT also calculates GHG emissions from shipping and transportation activities. GHG emissions from the Refinery are estimated and reported consistent with AB 32 as part of the mandatory monitoring and reporting program for the California Air Resources Board (CARB). Refinery GHG emissions are verified by a third party and subject to review by the CARB. Total combined GHG emissions from the Refinery, shipping, and transportation are then compared to the Baseline established in the EIR.

For operational year 2022, operations emissions were below Baseline values as shown in the table below. Furthermore, Chevron complied with additional TAC emission limits and odor complaint requirements in the MMRP. <u>See</u> Attachments 9, 10 and 11.

Table 2022 -CAP and GHG 2022 Facility Cumulative CAP and GHG Emissions (in Tons)		
Criteria Air Pollutant (CAP)	**Actual Emissions** [1]	**Baseline Emissions**
Carbon Monoxide (CO)[2,3]	374	525
Nitrogen Oxides (NOx)[2,3]	984	1,303
Particulate Matter (PM_{10})[2]	133	503
Sulfur Dioxide (SO_2)[2]	261	373
Volatile Organic Compounds (VOCs)[2]	826	973
GHG (MT CO2e)	4,069,557	4,602,947

[1]. Based on data from January 1 through December 31.
[2] This data comes from the most recent Emissions Inventory pursuant to BAAQMD Rule 12-15 and could be subject to change based on additional BAAQMD comments.
[3] Actual Emissions use best available data consistent with Rule 12-15 reporting.

As described further in Attachment 7 – Annual Reliability Program Report, the Refinery has fully implemented the Reliability Program. The Refinery's design and implementation of the Reliability Program has been extensively reviewed by CCHS, with the last round of review occurring in June 2022. One component of the Reliability Program is the Crude Monitoring Program, further described in Attachment 12 – Project Operations Compliance Plan. The Crude Monitoring Program specifies TAN and post-operation sulfur limits for crude and gas oil feedstocks to meet reliability requirements in the Project Annual Reliability Program.

Chevron continues to comply with its Title V permit requirements, which incorporate Project components as specified in the CUP and MMRP. Though flaring did occur at the Hydrogen Plant in 2022, the Refinery undertook investigations and made appropriate corrective actions to assist in the prevention of a similar issue from reoccurring. The Refinery continued to optimize operations in 2022 to successfully reduce flare events back to levels that align with Chevron's historical flare performance as a leader within industry when compared with 2019 levels. Chevron remains compliant with BAAQMD Modernization permit's 12-month rolling flare emission limits and the City's approved Modernization EIR. As documented in Attachments 1 and 2, Chevron has complied with the CUP and MMRP obligations related to flaring.

ENVIRONMENTAL AND COMMUNITY INVESTMENT AGREEMENT (ECIA)

On July 29, 2014, Chevron and the City of Richmond entered into an Environmental and Community Investment Agreement (ECIA). Pursuant to the ECIA, Chevron agreed to provide the equivalent of $30 million dollars in funding for local GHG reduction projects, as well as an additional $60 million in other community programs such as the newly formed Richmond Promise Scholarship Program, over a period of 10 years.

From 2014 to June 2023, Chevron has invested $76 million dollars pursuant to the ECIA. Chevron also entered into a 25-year lease with MCE pursuant to which MCE has developed a 10.5-megawatt solar project on Chevron property. Pursuant to the ECIA, Chevron is leasing land valued at approximately $10 million over the life of the lease for $1.00 per year. Construction of the MCE Solar One Project has been completed and the facility is currently operating.

PROJECT DESIGN FEATURES & OTHER EMISSION REDUCTION PROJECTS

As part of the Modernization Project, Chevron committed to several emission reduction project design features, which were also incorporated as mitigation measures. Several of these project design features have already been implemented and the emissions reductions are being realized today. Specifically:

- Chevron has put in service two newly built Suezmax ships. The main and auxiliary engines from these ships are required to utilize a level of emission control called Tier 2, pursuant to the International Maritime Organization (IMO) requirements for new engines that have been adopted by US EPA. The two new Chevron ships, named Pegasus Voyager and Polaris Voyager, instead utilize cleaner Tier 3 standard main and auxiliary engines as defined by the IMO. These ships were put into service and engine tests were completed and verified in October 2017.

- Chevron contracted with Foss Tugs to build and put into service a new tugboat utilizing Tier 4 main engines and Tier 3 auxiliary engines, which is more stringent than the Tier 3 main engines required by the current CARB rule. The new tugboat went into service in July 2017. Chevron continues to use Tier 4 tugboats to support its operations.

- Chevron committed to install three domes on its storage tanks and completed construction and placed into service one tank dome on T-3225 in 2018, one tank dome on T-3202 in 2019, and one tank dome on T-3189 in first quarter 2022. The installation of the dome on T-3189 was completed within three years of commencement of Project operations, per the requirement.

- Chevron committed to installing approximately 6,000 LED lights in its process areas by 2025. The LED light replacements include replacements of 70 watt (W)/100W high pressure sodium, 400W metal hydride, and 60-200W incandescent light fixtures located throughout the Refinery's process areas. Chevron completed this requirement in 2022. As part of its agreement with the City allowing for phased installation of the LED lights, Chevron also funded $2 million for the Cogeneration Project at the City's wastewater treatment plant, which will install a biogas fired engine at the plant and result in greenhouse gas reductions of 856 metric tons per year.

- Chevron committed to enroll its commercial electricity accounts with MCE and has done so since 2014.

COMPLIANCE, REPORTING, AND MONITORING

Pursuant to CUP condition A9, Chevron submitted its initial Compliance Plan on October 5, 2015, and provided subsequent updates to that plan on April 10, 2016, October 7, 2016, and November 4, 2016, and April 18, 2019. Chevron has reported its implementation of this plan and compliance with the various CUP and MMRP obligations through periodic communications, reports, and submittals as required by the CUP, MMRP, and Reliability Program. Additionally, on August 13, 2018, Chevron submitted a report to comply with the pre-operations requirements of 4.13-13a. These included updates on Chevron's consultations with the agencies that investigated the August 6, 2012 fire, including Cal/OSHA, the CSB, and Contra Costa County. Previously submitted reports and submittals are available at the City Planning Division for review.

Further, CUP condition G2 provides:

> Chevron shall include in its annual compliance reports (required by Condition H5) to the City information regarding the status of any ongoing agency investigations resulting from the August 2012 fire, including US EPA, CSB, Cal/OSHA, BAAQMD, and the County, including County safety audit(s) and safety culture audit(s). These reports shall include a comprehensive list of all findings, and corrective actions identified or requested by the agencies, as well as the status of Chevron's implementation of all such corrective actions. If Chevron determines not to implement any requested corrective action or otherwise not to address an agency finding, it shall explain in detail its rationale and the factual basis for its determination to do so.

In 1Q2021, the U.S. Chemical Safety Board's closed the final recommendation arising from the 2012 Chevron Richmond Fire. As such, all corrective actions taken to implement agency recommendations and as a result of Chevron's internal investigation have been implemented and, where required, integrated into Chevron's maintenance and operating procedures. The corrective actions are therefore closed. The Refinery submitted its twenty-fourth and final Quarterly Crude Fire Corrective Action Status Report (MM 4.13-13d) under the quarterly reporting requirement on March 31, 2021.

Chevron developed additional reports to further summarize and provide more detailed background for select annual operational requirements. See Attachments 9, 10, and 11.

PUBLIC OUTREACH

Pursuant to condition IV.G of the Reliability Program, Chevron has conducted six annual community and six employee town halls addressing the following topics:

1. The status of the enhanced safety measures being implemented by the Refinery following the August 6, 2012 fire, including actions taken to implement the recommendations made by public agencies that investigated the August 6 incident;

2. The status and/or results of the material upgrades, inspection and monitoring program, and ongoing compliance with the Richmond Industrial Safety Ordinance, including Project-related PHAs, DMRs, LOPAs, and ISSAs; and
3. The results of the reliability review revalidation and the status of any recommendations made as a result of this review.

The community town halls were held on March 31, 2016, March 30, 2017, February 22, 2018, March 27, 2019, August 12, 2020 and May 3, 2021. Transcripts from the 2016 through 2021 townhalls are on file with the City's Planning Division.

On December 21, 2021, the City and Chevron agreed that no community or workforce townhall would be required in 2022. See Attachment RP-7 of Attachment 7. The need to complete a community and/or workforce townhall for 2023 and future years will continue to be re-evaluated pursuant to condition IV.G.

CONCLUSION

Chevron continues to work cooperatively with the City to implement the Project and ensure that the various Project benefits are achieved in a safe and timely manner. Project operation and remaining construction components are proceeding accordingly, and Chevron will continue to provide all reports and complete all compliance actions required by the CUP and MMRP.

LIST OF ATTACHMENTS

ATTACHMENT	DOCUMENT	REQUIRED BY
1	CUP Compliance Table	Reference
2	MMRP Compliance Table	Reference
3	2022 Quarterly Construction Questionnaires	MMs (various)
4	Quarterly Crude Fire Corrective Action Status Reports	MM 4.13-13d
5	2022 Quarterly Construction Emissions Reports	MM 4.3-2a, 2b, 4.8-1
6	2022 Semi-Annual Construction Progress Reports	CUP H3
7	Annual Reliability Program Report	MM 4.13-7a, 7i, 7j, 13f, 13h; IV.A, IV.B, IV.H
8	2022 Local Hire Reports	ECIA 4.A(3)
9	Annual Operations Emissions Summary	MM 4.3-5a, 5b, 5c, 5d, 5e, 5f, 4.3-6a
10	Annual Odor Report	MM 4.3-8a
11	Feedstock and Fuel Gas Monitoring Summary	MM 4.3-6c, 6d
12	Project Operations Compliance Plan	CUP A5
13	Annual Spent Catalyst Report	MM 4.13-4e
14	Modernization Authority to Construct (ATC) Renewal	CUP A5

Table 1: Conditional Use Permit Conditions of Approval Compliance

Condition	Compliance
A1. The Modernization Project at the Chevron Richmond Refinery ("Facility") shall adhere to the City Charter, the Richmond Municipal Code ("RMC"), all applicable ordinances, all permits and approvals, all plans and specifications, and all Conditions of Approval.	Chevron is in compliance with all applicable federal, state, and local laws, regulations, and ordinances, all permits and approvals, all plans and specifications, and all Conditions of Approval. See Table 1: Conditional Use Permit Conditions of Approval Compliance and Table 2: Mitigation Measure Monitoring and Reporting Program Compliance.
A2. All of the mitigation measures and improvement measures set forth in the certified Chevron Refinery Modernization Project Environmental Impact Report (State Clearinghouse No. 2011062042) ("Modernization Project EIR") and Mitigation Monitoring and Reporting Program are hereby incorporated by reference and implementation of them is included as a condition of approval of this Conditional Use Permit.	See Table 2: Mitigation Monitoring and Reporting Program Compliance for a description of Chevron's compliance with the mitigation measures in the EIR.
A3. Any deviation or alteration of the approved plans shall be requested in writing and approved by the Planning and Building Services Department prior to implementation. Certain deviations or modifications to the approved plans may be subject to further discretionary review and approval by the City.	To date, Chevron has obtained and closed approximately 200 permits as primary construction has been completed. Permits are closed by the City as appropriate pursuant to the requirements of the California Building Code and California Fire Code, as well as Chapters 6.02, 6.04, and 8.16 of the Richmond Municipal Code. Certain secondary construction-related activities remain to be completed, for which Chevron will obtain the required permits from the City as required.
A4. The permittee, Chevron Products Company ("Chevron") shall apply for building, grading, and fire construction permits pursuant to RMC Sections 6.02.150, 12.44.030, 8.16.010 and 8.16.040. The permittee shall be responsible for paying all City costs related to plan review of the Project and paying the difference in impact fees between the 2008 Project and this Project, notwithstanding any terms of the current Building Permit Services Agreement.	To date, Chevron has obtained and closed approximately 200 permits as primary construction has been completed. Permits are closed by the City as appropriate pursuant to the requirements of the California Building Code and California Fire Code, as well as Chapters 6.02, 6.04, and 8.16 of the Richmond Municipal Code. Certain secondary construction-related activities remain to be completed, for which Chevron will obtain the required permits from the City as required. Chevron has paid the costs of reviewing

Condition	Compliance
	and processing all permits obtained to date and is not aware of any outstanding invoices.
A5. Prior to the issuance of a building, fire construction, or grading permit for any portion of the Modernization Project, Chevron shall demonstrate to the Planning and Building Services Department that it has obtained necessary permits and approvals from reviewing agencies for such portions of the Modernization Project, including but not limited to Authority to Construct permits (ATCs) from the Bay Area Air Quality Management District ("BAAQMD"), as amended, if needed, based on Modernization Project changes since issuance of the ATCs for the 2008 Project.	The Refinery applied for ATC renewal and submitted the required fees on February 12, 2023. On June 22, 2023, BAAQMD renewed the ATC for an additional two-year period ending February 12, 2025.
A6. Chevron shall record the conditions of approval of this Conditional Use Permit with the Contra Costa County Recorder in a form that is satisfactory to the City. An endorsed copy of the recorded Conditional Use Permit shall be filed with the Planning and Building Services Department within ten (10) days of recordation. This Conditional Use Permit shall not take effect until it has been recorded and an endorsed copy filed with the Planning and Building Services Department. (RMC § 15.04.910.070(A).)	Chevron recorded the conditions of approval as required by this condition with Contra Costa County on June 25, 2015 (DOC-2015-0131407-00). A copy of the recorded CUP was provided to the City in June 2015.
A7. Upon a duly noticed and conducted public hearing, the approval of this Conditional Use Permit (CUP) shall be revocable ten (10) years from the date of approval for any Project component as listed in Table 3-1 of Volume 1 of the Modernization Project EIR, except as modified by the Project Plans dated April 2014 (reviewed and recommended for approval by the DRB on April 30, 2014) for which Chevron has not obtained building permits by that time. The use permit shall be vested with respect to each component when a building permit has been issued and construction of that component has been diligently pursued. The CUP shall expire upon the expiration of the building permit with respect to any of the components of the Modernization Project for which construction has not commenced. (RMC § 15.04.910.070(C).) For any component of the Modernization Project that has not commenced construction within the initial ten (10) year period provided herein, Chevron shall have the right to one (1) automatic extension of time not to exceed two (2) years, provided that Chevron informs the City	No action necessary for compliance.

Condition	Compliance
in writing of its intent to exercise such extension no less than thirty (30) days prior to the termination of the initial ten (10) year period. Revocation of this CUP shall not relieve Chevron of the obligation to comply with the Conditions of Approval as they apply to any portion of the Modernization Project for which a building permit has been granted.	
A8. To the fullest extent permitted by law, Chevron shall defend, indemnify, and hold harmless the City of Richmond, its council, boards, commissions, agents, officers, employees, consultants, successors and assigns from and against any and all claims, demands, obligations, proceedings, actions, causes of action, suits, losses, judgments, fines, penalties, damages, liabilities, costs and expenses (including without limitations attorney's fees, disbursements, and all other professional or expert fees and costs) to attack, set aside, void or annul any approval of the Planning Commission, City Council, Planning Director, or any other employee, department, committee, or agency of the City concerning the environmental review, use permit approval, other actions, permits or approval for the Modernization Project, including any Project condition imposed by the City or any of its agencies, departments, commissions, boards, agents, officers, employees, or council. This duty to indemnify includes any damages awarded against the City, if any, the cost of suit, attorney's fees, and other costs and expenses incurred in connection with such claim, action or proceeding and whether incurred by Chevron, the City and/or the parties initiating or bringing such claim, action or proceeding. In the event Chevron is required to defend the City, the City shall retain the right to (a) approve the counsel to defend the City, (b) approve all significant decisions concerning the manner in which the defense is conducted, and (c) approve all settlements, which approval shall not be unreasonably withheld. The City shall have the right not to participate in said defense, except the City shall cooperate with Chevron in the defense of said claim, action or proceeding.	No action necessary for compliance.

Condition	Compliance
A9. Within six (6) months after approval of this Conditional Use Permit or prior to issuance of the first grading, fire construction, or building permit for the Modernization Project, whichever is earlier, Chevron shall submit a written plan describing how it will meet the requirements of each Condition of Approval. An independent auditor or other third party expert selected by the City shall review the plan and shall advise the Planning and Building Services Department on whether or not Chevron's plan is reasonably likely to achieve compliance with each Condition of Approval. If the City is not satisfied with the compliance plan submitted by Chevron, Chevron shall cooperate in good faith with the City and its experts to modify the plan to satisfy the City. Chevron shall reimburse the City for any and all costs and expenses associated with the review of the plan and the auditor or third party's review and advice to the City regarding Chevron's written plan.	Chevron submitted its initial Compliance Plan on October 5, 2015, and provided subsequent updates to that plan on April 10, 2016, October 7, 2016, November 4, 2016, and April 18, 2019.
A10. All reporting obligations established by these conditions of approval for the CUP, including any documents or reports Chevron must submit pursuant to mitigation measures incorporated herein by reference, shall be subject to the protection for trade secrets provided in Richmond Municipal Code § 6.43.110 and California Health and Safety Code section 25538 incorporated therein.	No action necessary for compliance.
B1. Chevron shall not import crude oil or gas oil to the Facility by rail, including from the proposed WesPac oil storage terminal in Pittsburgh, CA and the Kinder-Morgan facilities at the BNSF Richmond railyard, unless it first obtains all necessary permits from the appropriate agencies, including the City of Richmond.	Chevron does not import crude oil or gas oil to the Facility by rail. Further, Chevron has incorporated this requirement into its compliance system and updated its Management of Change (MOC) process checklist for evaluating new crudes to ensure ongoing compliance with this obligation.
B2. Within sixty (60) days after issuance of the first building permit for the Hydrogen Plant Replacement following approval of this Conditional Use Permit, Chevron shall file a complete application with the BAAQMD to cause the Facility's Title V permit to be amended to reduce the maximum permitted throughput limits for the SDA to 50,000 barrels per day on an annual average, and shall report to the Planning and Building Services	Chevron has not operated the SDA above a maximum throughput rate of 50,000 barrels per day on an annual average basis. Chevron submitted a permit application to the BAAQMD on August 10, 2016 to reduce the maximum annual permitted throughput limit for the SDA plant from 56,000 barrels per day to 50,000 barrels per day on an annual average basis. Chevron shared

Condition	Compliance
Department when the amendment application has been submitted and when the amendment has been approved. Until such time as the permit amendment is approved by BAAQMD, Chevron shall not operate the SDA above a maximum throughput rate of 50,000 barrels per day as a condition of approval of this Conditional Use Permit. Upon issuance of the permit amendment reducing the SDA throughput limit to 50,000 barrels per day, this Conditional Use Permit condition limiting SDA throughput shall expire and be superseded by the amended permit limit and corresponding BAAQMD enforcement authority.	this permit application with the City in Transmittal #16 dated October 27, 2016. The updated permit to operate (PTO) was received in September 2018, and the new limits will become an incorporated part of the Refinery's Title V permit. Chevron is operating in compliance with the updated PTO and Title V Permit limits.
B3. The Facility shall not operate in a manner that would allow it to process in excess of 50,000 barrels per day of Crude Unit vacuum tower bottoms (residuum) on an annual average basis consistent with Chevron's February 18, 2014 attestation to the City.	Chevron has not processed crude unit vacuum tower bottoms in excess of 50,000 barrels per day on an annual average basis. Chevron has incorporated this limit into its compliance system for project operations submitted to the City of Richmond April 18, 2019.
B4. The Facility shall not operate in a manner that would allow it to process in excess of 57,600 barrels per day of unhydrofined naphtha on an annual average basis consistent with Chevron's February 18, 2014 attestation to the City.	Chevron has not processed unhydrofined naphtha in excess of 57,600 barrels per day on an annual average basis. Chevron has incorporated this limit into its compliance system for project operations submitted to the City of Richmond April 18, 2019.
B5. Chevron shall comply with its Title V permit throughput and emissions limits for all Refinery units affected by the Modernization Project as identified in the Final Environmental Impact Report, subject to the modifications required by Conditions B2, B7, and B8, and failure to comply with these permit limits, as determined by the Bay Area Air Quality Management District, may be grounds to modify or revoke this Conditional Use Permit.	Chevron has complied with all Modernization throughput limits. Chevron continues to work with the BAAQMD to ensure that the Project can operate within the applicable process unit-specific limits in the BAAQMD Permit Conditions.
B6. Chevron shall operate the FCC FHT primarily as a hydrotreating unit, and shall obtain any necessary permits from the appropriate agencies prior to undertaking any significant physical modifications, such as those to the	Chevron has only operated the FCC FHT primarily as a hydrotreating unit. Chevron has incorporated this requirement into its compliance system for project operations submitted to the City of Richmond April 18, 2019.

Condition	Compliance
separation section and distillation unit, that would be necessary to enable the FCC FHT to operate primarily as a hydrocracking unit.	
B7. Within sixty (60) days after the issuance of the first building permit for the Hydrogen Plant, Chevron shall file a complete application with the BAAQMD to cause the Facility's Title V permit to be amended to reduce the maximum permitted production limit for the Hydrogen Plant Trains to 244 million scfd on an annual average basis, and shall report to the Planning and Building Services Department when the amendment application has been submitted and when the amendment has been approved. Until such time as the permit amendment is approved by BAAQMD, Chevron shall not produce more than 244 million scfd on an annual average basis as a condition of approval of this Conditional Use Permit. Upon issuance of the permit amendment reducing the limit to 244 million scfd on an annual average basis, this Conditional Use Permit condition limiting hydrogen production to 244 million scfd shall expire and be superseded by the amended permit limit and corresponding BAAQMD enforcement authority.	At the end of commissioning on April 17, 2019, the replacement hydrogen trains began operating under the new production limit of 244 million scfd on an annual average basis. Permit Condition 24136, Part 5 of the ATC issued by the BAAQMD in February 2015 contains a maximum permitted production limit for the Hydrogen Plant Trains of 244 million scfd on an annual average basis. Pursuant to the terms of the ATC, the new limits will be incorporated into the Refinery's Permit to Operate (PTO), which will become an incorporated part of the Refinery's Title V permit. Chevron submitted a letter to the City dated September 30, 2015 describing compliance with this condition (as well as conditions B8 and B9) in more detail. Chevron is operating in compliance with the Modernization ATC and Title V Permit limits.
B8. Within sixty (60) days after the issuance of the first building permit for the Hydrogen Plant Replacement, Chevron shall file a complete application with the BAAQMD to cause the Facility's Title V permit to be amended to reduce the maximum permitted sulfur removal capacity from the Sulfur Recovery Units to 750 long tons per day on an annual average basis and shall report to the Planning and Building Services Department when the amendment application has been submitted and when the amendment has been approved. Until such time as the permit amendment is approved by BAAQMD, Chevron shall not remove more than 750 long tons per day of sulfur on an annual average basis as a condition of approval of this Conditional Use Permit. Upon issuance of the permit amendment reducing the sulfur recovery limit to 750 long tons per day on an annual average basis, this Conditional Use Permit condition limiting sulfur removal to 750 long tons per day shall expire and be superseded by the amended permit limit and corresponding BAAQMD enforcement authority.	Chevron has not removed more than 750 long tons per day of sulfur on an annual average basis. Permit Condition 25814, Part 2 supersedes Permit Condition 24136, Part 79 and limits sulfur removal to less than 592.7 long tons per day on an annual average basis. The new sulfur removal capacity limit will be incorporated into the Refinery's Permit to Operate (PTO), which will become an incorporated part of the Refinery's Title V permit. Chevron submitted a letter to the City dated September 30, 2015 describing compliance with this condition (as well as conditions B7 and B9) in more detail.

Condition	Compliance
B9. Within sixty (60) days after the issuance of the first building permit for the Hydrogen Plant Replacement, Chevron shall file a complete application with the BAAQMD to cause the Facility's Title V permit to be amended to increase the maximum throughput of the FCC FHT to 80,000 barrels per day of gas oil on an average annual basis, and shall report to the Planning and Building Services Department when the amendment application has been submitted and when the amendment has been approved. Until such time as the permit amendment is approved by BAAQMD, Chevron's current FCC FHT permitted throughput limits shall apply.	Permit Condition 24136, Part 80 of the ATC issued by the BAAQMD specifically sets this limit and references CUP Condition B9 as the basis for the limit. Following completion of Project construction for this work scope, BAAQMD Permit Condition 24136, Part 80 will be incorporated into the Refinery's Title V permit.
B10. Operation of the new hydrogen plant is subject to all mitigation measures, including those specified in the Reliability Program, set forth in the EIR and final Mitigation Monitoring and Reporting Program. For any future hydrogen export project supplied by hydrogen from the Hydrogen Plant Replacement, associated greenhouse gas emissions must be mitigated to a "No Net Increase" level relative to Baseline using the mitigation measures specified in Mitigation Measures 4.8-2 and 4.8-2B.	See Table 2: Mitigation Measure Monitoring and Reporting Program Compliance for information regarding Chevron's compliance with mitigation measures in the EIR and requirements of the Reliability Program. The hydrogen export project referenced in this condition was proposed by Praxair, the previous owner and developer of the proposed new Hydrogen Plant. Chevron is now the owner of the Hydrogen Plant and has not proposed a hydrogen export project.
B11. This Conditional Use Permit does not authorize construction or operation of a pipeline for off-site export or delivery of any hydrogen produced by the Hydrogen Plant Replacement, and any pipeline for off-site export or delivery of any hydrogen produced by the Hydrogen Plant Replacement shall be subject to additional City permitting requirements and environmental review as required by the California Environmental Quality Act, Public Resources Code § 21000 et seq..	No action necessary for compliance.
B12. Chevron shall not emit greenhouse gases from the Facility in excess of 4,602,947 metric tons (MT) per year, and shall ensure it achieves "no physical increase" in greenhouse gas emissions from the Facility resulting from the Project. The 4,602,947 MT per year limit may take into account any reductions in greenhouse gas emissions achieved through on-site mitigation measures specified in the Mitigation Monitoring and Reporting	Chevron has fulfilled this commitment for 2022. See Attachment 9: Annual Operations Emissions Summary.

Condition	Compliance
Program, including but not limited to the water conservation measures, FCC cooling water tower motor upgrade, the installation of LED lighting, and participation in the Marin Clean Energy program.	
C1. Chevron and its contractors and subcontractors shall use low- Volatile Organic Compound paints and coatings, as required by BAAQMD Regulation 8, Rules 3 and 49.	Chevron issued Instructions to Contractors (ITC) implementing this condition. See Transmittal #6 to City of Richmond on February 2, 2016. Chevron tracks compliance with this condition through regular field audits, the results of which are available onsite. Chevron reports compliance with this condition, as applicable, in quarterly construction questionnaires. See Attachment 3: 2022 Quarterly Construction Questionnaires.
C2. Chevron shall incorporate Condition C1 and all adopted mitigation measures pertaining to construction equipment and materials handling into all construction bid documents and contracts, as well as grading and building permit plans, as applicable.	See Condition C1.
C3. Chevron shall submit documentation of compliance with Condition C2 to the Planning and Building Services Department prior to issuance of grading permits and building permits.	See Condition C1.
D1. Chevron shall construct and operate the Modernization Project equipment and facilities to comply with all applicable BAAQMD Authority to Construct/Permit To Operate permit conditions (issued in connection with the 2008 Renewal Project, as may be amended for the Project) and all applicable BAAQMD Rules and Regulations.	Chevron constructed and operates the Modernization Project equipment and facilities in compliance with applicable BAAQMD Authority to Construct/Permit To Operate. Chevron continues to work with the BAAQMD to ensure that the Project can operate within the applicable process unit-specific limits in the BAAQMD Permit Conditions.
D2. Nothing in this Conditional Use Permit shall be interpreted to allow air emissions or other emissions that are not in compliance with the conditions of any permit or Authority to Construct ("permit") issued by the BAAQMD. If the BAAQMD adopts a condition or issues an approval that would reduce emissions which otherwise would be allowed under this	No action necessary for compliance.

Condition	Compliance
Conditional Use Permit, the BAAQMD's lower emissions limit shall apply. If any of the conditions of this Conditional Use Permit result in lower emission limits than the BAAQMD's permit conditions, then the lower emission limits shall apply.	
D3. On or before December 31, 2015, Chevron shall install a test platform and sampling port, consistent with BAAQMD's "Guidance for Construction of Particulate Sampling and Test Facilities," on the FCC to allow for supplemental testing of PM10 and PM 2.5 pursuant to USEPA Test Method 201a/202. Chevron shall thereafter use this new test platform and sampling port to conduct further sampling of PM following installation, and shall report sampling results as part of the Mitigation Monitoring and Reporting Program (MMRP). Chevron shall continue to comply with BAAQMD permit requirements for the FCC unit, including without limitation any new particulate matter monitoring requirements using this new test platform and sampling port, and any future emission limits that may be established for condensable PM.	On November 20, 2015, the Bay Area Air Quality Management District ("BAAQMD") approved the Chevron Richmond Refinery's protocol for the FCC Plant Particulate Source Test Sampling Facility. Installation of the Test Sampling Facility was completed by the end of 2015. The BAAQMD conducted PM source testing twice in May 2016. BAAQMD Regulation 6-5, adopted in December 2015, establishes a numerical standard for the ammonia in the exhaust gases from refinery Fluid Catalytic Cracking Units ("FCCUs"). Under Regulation 6-5, Section 403, the Richmond Refinery submitted its Optimization and Demonstration protocol in February 2016. The BAAQMD approved this protocol in March 2016 and testing began that same month. The new sampling ports are being used for all related PM source testing. Chevron collected data on PM 2.5, PM 10, Total Filterable PM, Condensable PM & Total PM under this protocol. Chevron reported the results of the testing to BAAQMD in late 2017. As part of routine compliance with Title V Permit Condition #11066 Part 7B, Chevron also conducts routine quarterly testing at the FCCU for Non-Sulfuric PM only, using the new sampling ports. These compliance reports are submitted to the BAAQMD within 45 days of completing the tests.
E1. Chevron shall notify the Planning and Building Services Department when flaring notifications are made to the BAAQMD pursuant to BAAQMD Regulation 12 Rule 12-405.	The Refinery Instruction (RI-434) for agency reporting has been modified to specify that any notifications required under Reg. 12-12-405 are made to Richmond Police, Fire dispatch, and to the Richmond Planning Division. Effective March 1, 2021, per the

Condition	Compliance
	request of the City of Richmond Battalion Chief the Reg.12-12-405 flare notifications are made via e-mail to Fire and Police Dispatch. Subsequent to approval by Planning Community Development Director on February 28, 2021 the 12-12-405 flare notifications to the Planning Division are also made via e-mail consistent with the Fire and Police Dispatch by the next business day.
F1. Chevron shall be required to comply with all rules, regulations and procedures of the National Pollutant Discharge Elimination System (NPDES) for municipal, construction and industrial activities as promulgated by the California State Water Resources Control Board or any of its Regional Water Quality Control Boards (San Francisco Bay - Region II, or Central Valley - Region IV) that are applicable to the Facility and to construction on Facility property. Compliance shall include developing best management practices (BMPs) for the reduction or elimination of storm water pollutants. The BMP plan shall be acceptable to the RWQCB.	The Chevron Richmond Refinery's wastewater treatment effluent and stormwater discharges are covered under NPDES No. R2-2016-0047, CA0005134, adopted by the San Francisco Bay Regional Water Quality Control Board (Region 2) on December 14, 2016, effective February 1, 2017, and currently in compliance due to being administratively extended from January 31, 2022 by the RWQCB. In compliance with Order R2-2016-0047, Chevron maintains a Storm Water Pollution Prevention Plan (SWPPP) that includes best management practices (BMPs) for industrial and construction activities and other SWPPP-required elements as outlined in the Regional Standard Provisions. Chevron submits an updated SWPPP annually to the RWQCB by October 1st of each year.
F2. Chevron shall provide the Planning and Building Services Department with copies of any required Anti-Degradation Report and, when requested, monthly self-monitoring reports when those reports are submitted to the RWQCB. The documents shall be provided to the City at no cost.	Since approval of the Project, Chevron has not been required to file an Anti-Degradation Report with RWQCB. Chevron will provide the Planning and Building Services Department with copies of any required Anti-Degradation Report and, when requested, monthly self-monitoring reports when those reports are submitted to the RWQCB.
G1. Chevron shall implement the Modernization Project Reliability Program (set forth as Appendix 4.13-PROG of the EIR) in its entirety as a condition of this Conditional Use Permit.	Chevron has implemented the Modernization Project Reliability Program, including processes to implement and track ongoing obligations. Contra Costa Health Services has reviewed compliance materials related to Chevron's implementation of the Reliability Program in 2018, 2019, 2020 and 2022; Chevron

Condition	Compliance
	continues to work with CCHS in this regard. The most recent CCHS review was completed in September 2022.
G2. Chevron shall include in its annual compliance reports (required by Condition H5) to the City information regarding the status of any ongoing agency investigations resulting from the August 2012 fire, including US EPA, CSB, Cal/OSHA, BAAQMD, and the County, including County safety audit(s) and safety culture audit(s). These reports shall include a comprehensive list of all findings, and corrective actions identified or requested by the agencies, as well as the status of Chevron's implementation of all such corrective actions. If Chevron determines not to implement any requested corrective action or otherwise not to address an agency finding, it shall explain in detail its rationale and the factual basis for its determination to do so.	The latest version of reports required pursuant to Mitigation Measures 4.13-13a and 4.13-13d, which address ongoing agency investigations and corrective actions in response to the August 2012 fire, are provided. The Pre-Operations Report (MM 4.13-13a) was submitted in Transmittal #32 on August 13, 2018 prior to commencement of operations. The 4.13-13a pre-construction report was submitted in Transmittal #13 on May 4, 2016 prior to commencement of construction. In 1Q2021, the U.S. Chemical Safety Board's closed the final recommendation arising from the 2012 Chevron Richmond Fire. As such, all corrective actions taken to implement agency recommendations and as a result of Chevron's internal investigation have been implemented and, where required, integrated into Chevron's maintenance and operating procedures. The corrective actions are therefore closed. The Refinery submitted its twenty-fourth and final Quarterly Crude Fire Corrective Action Status Report (MM 4.13-13d) under the quarterly reporting requirement on March 31, 2021. There will be no further updates pursuant to Mitigation Measure 4.13-13d.
G3. Chevron shall remain in compliance with the terms of its probation agreement entered into on August 5, 2013 with the State of California for the duration of the term of the probation agreement. If, at any time, Chevron receives notice (oral or written) from the State or Cal/OSHA alleging that Chevron is in violation of any term of its probation agreement, Chevron shall provide notice to the City Planning and Building Services Department within 24 hours of receipt of the notification from the State or Cal/OSHA. Violation of any term of the probation agreement, as determined by a final decision of Cal/OSHA or other applicable agency party to the probation agreement after Chevron has exhausted its due process right to appeal or	Pursuant to the conditions of probation, the probationary period ended in February 2017. During the probationary period, Chevron did not receive any notices from the State or Cal/OSHA that Chevron was in violation of any term of probation. **Chevron has implemented this condition, and this condition will not be addressed in future annual reports.**

Condition	Compliance
otherwise challenge alleged violations, may serve as grounds for the revocation of the subject Conditional Use Permit issued for the Modernization Project.	
G4. During the next turnaround for the crude unit, and no later than the end of 2017, Chevron shall upgrade with inherently safer technology any carbon steel piping circuits in the crude unit identified by the Reliability Analysis as potentially having increased sulfidation corrosion rates under Project conditions.	As reported to the City in a letter dated February 15, 2017, the Refinery completed its turnaround for the No. 4 Crude Unit ("4CU") in fourth quarter 2016. This turnaround included replacement of the 17 piping circuits and 4 partial piping and valve replacements identified in the Program. **Chevron has implemented this condition, and this condition will not be addressed in future annual reports.**
G5. Within six months prior to commencing Project operations, Chevron shall review the corrosion data and flag dates of fixed equipment and piping in process units susceptible to high-temperature sulfidation identified in the Reliability Analysis (taking into account the most current actual conditions combined with post-Project projected corrosion rates predicted based on McConomy curves) and ensure that enhanced monitoring and inspection measures, including those identified in the Reliability Analysis and Reliability Program, are implemented after commencement of Project operations to periodically verify actual post-Project corrosion rates and adjust any flag dates or replacement plans as warranted. Pursuant to the Richmond Industrial Safety Ordinance, Chevron shall make all information relating to its verification, monitoring, and inspection activities available to the City and County and their respective third-party experts upon request, with review by a committee constituted of the dedicated full-time process safety inspector required by the Richmond Industrial Safety Ordinance and Mitigation Measure 4.13-7d, the Contra Costa County Health Services Chief Environmental Health and Hazardous Materials Officer, and a qualified third-party expert selected by the City.	In July 2018, Chevron utilized the most current actual conditions in conjunction with predicted post-project corrosion rates and completed a corrosion data and flag date review for each of the affected process units. Additionally, Chevron has implemented enhanced monitoring and inspection measures in each of the affected process units. CCHS verified completion of this measure as part of its pre-startup review. **Chevron has implemented this condition, and this condition will not be addressed in future annual reports.**
H1. The Modernization Project consists of a number of individual components; construction of the components is expected to occur at various times following approval of this Conditional Use Permit. To ensure that the City is able to properly evaluate the plans for each phase of construction,	To date Chevron has obtained and closed approximately 200 permits as primary construction has been completed. Secondary construction activities including the doming of T-3189 and the

Condition	Compliance
Chevron shall notify the Planning and Building Services Department prior to the commencement of planned construction of any major component, and shall work with the Planning and Building Services Department to develop a mutually acceptable schedule for submission and review of plans and required documentation in advance of construction. Submittals shall contain sufficient information to verify that they are within the scope of approval of this Conditional Use Permit.	GHG Construction Mitigation Project completed construction in 1Q2022.
H2. Chevron shall notify the Police, Public Works, and Engineering Departments and shall meet with designated representatives of these departments in advance of construction and Quarterly or as otherwise agreed, during construction, to coordinate issues related to construction traffic and the implementation of traffic control mitigation measures.	Chevron has developed and implemented a strategy for traffic management in conjunction with the City Public Works, Engineering, and Police Departments. Chevron reports compliance with this condition, as applicable, in quarterly construction questionnaires. See Attachment 3: 2022 Quarterly Construction Questionnaires.
H3. Chevron shall submit semi-annual construction progress reports to the Planning and Building Services Department on March 31 and October 31 during all phases of project construction.	Chevron has submitted semi-annual construction progress reports to the Planning and Building Services department as Transmittals #16A-1 through #16A-14. See Attachment 6: 2022 Semi-Annual Construction Reports.
H4. Chevron shall comply with the Mitigation Monitoring and Reporting Program (MMRP) adopted as part of the approval of this Conditional Use Permit.	See Table 2: Mitigation Measure Monitoring and Reporting Program Compliance for details regarding compliance with mitigation measures in the EIR.
H5. On or before March 31 of each year beginning after the first full year of Project construction, Chevron shall submit to the City both an annual compliance report, and payment of an amount sufficient to cover staff costs (including time) associated with the compliance review, documenting compliance with the conditions of approval of this Conditional Use Permit and the mitigation measures and improvement measures as shown in the Mitigation Monitoring and Reporting Program, and to cover costs and fees (including time) of third party experts retained by the City pursuant to any mitigation measure of the Project or condition of approval. Chevron shall submit payments to the County and BAAQMD for their respective costs (including County and BAAQMD staff time, and time, costs, and fees of third party experts retained by the County pursuant to any mitigation	Chevron submitted its first annual compliance report on March 30, 2018, and its second report on March 29, 2019. The City of Richmond agreed during the June 6, 2019 Planning Commission Meeting that post operational annual compliance reports are due by September 1 starting in 2020 and going forward. This submittal is the sixth annual compliance report following commencement of Project operations. Chevron has paid all invoices received from the City of Richmond and other agencies related to this condition and is not aware of any outstanding invoices.

Condition	Compliance
measure of the Project), in accordance with a payment schedule determined by the County and BAAQMD. Following the first compliance report and payment from Chevron, and prior to March 31 of the next year, the City shall provide Chevron on an annual basis an accounting of the City's expenditure of the compliance review payment, which at a minimum shall include the City staff who worked on the compliance review, the time spent, and a general description of the work performed. The annual compliance reports shall contain supporting information from other regulatory agencies, as applicable. For each condition and mitigation measure, the report shall identify the status of compliance, times and dates of the monitoring and whether further action is required. The Planning Commission will hold hearings at a frequency of once each year to review Chevron's compliance with the conditions of approval of this Conditional Use Permit, including compliance with the mitigation measures and improvement measures. If, in the opinion of the Planning Commission, Chevron has completed all mitigation measures and improvement measures, and has complied with all conditions of approval, no further reports shall be necessary. The Planning and Building Services Department shall notify Chevron in writing when the Planning Commission has determined that annual reports will no longer be necessary pursuant to this Condition.	
H6. The Planning and Building Services Department may retain third party experts to assist the City in monitoring Chevron’s compliance with the conditions of this Conditional Use Permit, including compliance with mitigation measures and improvement measures specified in the Mitigation Monitoring and Reporting Program required as part of the approval of this Conditional Use Permit, and including review of any reports submitted to the City by Chevron in accordance with any mitigation measure or condition of approval. All costs of compliance monitoring, including the costs incurred by the City for the third party experts assisting the City with the compliance monitoring, shall be paid by Chevron. To the extent that the City is required to reimburse BAAQMD for any costs and staff fees associated with BAAQMD's assistance in monitoring compliance with these conditions of approval or compliance with mitigation measures specified in the Mitigation Monitoring and Reporting Program included as part of the	Chevron has compensated and will continue to compensate the City for costs described in this condition based on invoices submitted to Chevron. Chevron is not aware of any outstanding invoices.

Condition	Compliance
approval of this Conditional Use Permit, Chevron shall reimburse the City for all such costs and fees.	
H7. Chevron shall provide the Planning and Building Services Department with copies of any application to the BAAQMD for a new Authority to Construct or any amendment to an existing Authority to Construct for any part of the Modernization Project so that the City may evaluate the proposal for consistency with the scope of this Conditional Use Permit approval and the Modernization Project EIR analysis. The documents shall be provided at no cost to the City. The City may retain a third party expert to assist the City in evaluating the compliance with this CUP, and Chevron shall reimburse the City for all such third-party related costs, including costs for City staff time in selecting and working with such experts, costs and expenses of any third party experts retained by the City to support the City's compliance verification role pursuant to the mitigation measures specified for the Project. The City shall provide Chevron on an annual basis an accounting of the City's expenditure of the costs paid by Chevron which, at a minimum, shall include the City staff who performed work, the time spent, and a general description of the work performed.	See CUP A4. The ATC from the BAAQMD was renewed and is effective until **February 12, 2025**. The Refinery applied for ATC renewal and submitted the required fees prior to **February 12, 2023** and received the renewed ATC on **June 22, 2023**. See Attachment 14: Modernization ATC Renewal.
H8. Chevron shall provide the Planning and Building Services Department with copies of its emissions reports to the BAAQMD whenever such reports are requested by the City to evaluate whether the Modernization Project is being constructed or operated consistent with this Conditional Use Permit. The documents shall be provided at no cost to the City.	Chevron tracks construction and operations emissions pursuant to the Construction Emissions Module and Operations Emissions Tracking Tool, respectively, developed by the City's environmental consultant, Ramboll ENVIRON. See Attachment 5: 2022 Quarterly Construction Emissions Reports and Attachment 9: Annual Operations Emissions Summary.
H9. If Chevron applies to the BAAQMD to increase the permitted throughput of any Modernization Project equipment or component, Chevron shall notify the Planning and Building Services Department of such application, which notice may trigger discretionary City review and possible amendment of the conditions of this Conditional Use Permit or requirement of a new Conditional Use Permit.	Chevron has not applied to the BAAQMD to increase permitted throughput of any Modernization Project equipment or component.

Condition	Compliance
I1. All conditions of approval shall be printed on the final construction plan set submitted for building permits. Except as modified by the conditions of approval below (I2 through I5), final construction plans shall be in substantial compliance with the plan set (sheets 1.0-8.0 and visualizations 10-1 to 10-9 and 11-1 to 11-8) dated April 2014. Any deviations from the approved plan shall be subject to review and approval by the Director of Planning and Building Services per A3 above.	Chevron has created drawing sheets that reproduce all conditions of approval and mitigation measures. Any deviations from the approved plan shall be subject to review and approval by the Director of Planning and Building Services per Condition A3. A copy of the drawing sheets was transmitted to the City on 04/29/16 as Transmittal #12.
I2. Landscape plans for proposed site and Richmond Parkway/Castro Street landscaping shall be submitted for review and approval by the Design Review Board prior to issuance of building permits. A minimum of 1.25 acres of landscaping shall be provided. If the minimum required new landscaping cannot be provided in the identified locations, a revised landscape plan identifying the new propose planting areas shall be submitted for review and approval by the DRB.	The landscape plans for the Project were approved by the City's Design Review Board at its February 24, 2016 meeting, and written confirmation of this approval was issued by the City to Chevron on March 1, 2016. Implementation of the landscape plan has been completed. **Chevron has implemented this condition, and this condition will not be addressed in future annual reports.**
I3. When selecting tanks on which to install domes necessary to mitigate Project emissions in accordance with the EIR, Chevron and the City shall prioritize potential tanks that (1) have the highest emission-reduction potential to help achieve the Project's commitment to no net increase in emissions; and (2) minimize the visual impact of the individual tank domes by, among other things, first considering installing domes on tanks at lower elevations or in locations that are less visible from public roadways.	The MMRP identifies 3 tank dome projects. The domes on T-3225 and T-3202 were completed and put into service in March 2018 and February 2020, respectively. Construction for the third dome on T-3189 was completed and the tank was placed in service in March 2022. As of this report, Chevron has not identified the need for additional tank domes, which would trigger this condition. Chevron shall comply with this condition in the event additional tank domes are necessary following commencement of Project operations.
I4. Non-potable or treated process water shall be used in the watering of exposed surfaces to reduce dust.	See Condition C1.
I5. The new replacement LED lighting shall not have a greater illumination output than the existing lighting being replaced and a photometric plan or equivalent method for existing light and proposed lighting shall be submitted for verification prior to installation of the replacement lights.	Chevron has prepared a plan to ensure that the new replacement LED lighting does not have a greater illumination output than the existing lighting. Chevron submitted a photometric plan to the City as transmittal #34 for verification prior to implementation of the LED lighting project design feature.

Condition	Compliance
J1. Chevron shall maintain site and surrounding areas in an orderly fashion. Litter and debris shall be contained in appropriate receptacles and shall be removed as necessary. Following cessation of construction activity, all construction materials and debris shall be removed. To the maximum extent feasible, and in compliance with AB 939, demolition debris and construction waste shall be diverted from the waste stream. Prior to commencement of demolition or construction, Chevron shall meet with the Planning and Building Services Department to present its plan for the diversion of waste.	Chevron has developed a Waste Diversion Plan/Debris Recovery Plan to address this condition and the requirements of MM 4.8-1g, 4.8-1k, and 4.17-1. The Plan was submitted to the City of Richmond for review and approval on March 25, 2016. The Waste Diversion Plan/Debris Recovery Plan has been presented to contractors and is Appendix C of the Instructions to Contractors (ITC) document.
K1. This Conditional Use Permit may be revoked or modified, including the imposition of new conditions, upon a finding of any of the grounds set forth in Richmond Municipal Code Section 15.04.990.010.A.1-4, including violation of the conditions of approval. (RMC §§ 15.04.910.070.F, 15.04.990.) This remedy is cumulative to any other remedy allowed by the Municipal Code or any other applicable law. (RMC § 15.04.990.)	No action necessary for compliance.

Table 2: Mitigation Measure Monitoring and Reporting Program Compliance

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
4.1 AESTHETICS						
Construction or operation of the Modernization Project would result in no significant impacts to Aesthetics. No mitigation is required or recommended.					N/A	None required because no mitigation required.
4.2 AGRICULTURAL RESOURCES						
Construction or operation of the Modernization Project would result in no impacts to agricultural or forestry resources. No mitigation is required.					N/A	None required because no mitigation required.
4.3 AIR QUALITY						
4.3-1: All remaining construction activities for the Modernization Project shall comply with the following Bay Area Air Quality Management District (BAAQMD) construction mitigation measures:	Chevron / Project Contractor	During construction activities	Chevron, BAAQMD and, City of Richmond Planning and Building Services Department	BMPs shall be listed on Plans submitted for building permits, Review and verification by building inspectors, regularly during construction.	Y	Chevron has issued "Instructions to Contractors" specifying implementation of requirements 4.3-1a through 1o, with exception of 1d and 1h which are not applicable due to project location. See Transmittal #6 to City of Richmond on February 2, 2016. Chevron conducts routine field audits to verify the contractors are appropriately implementing these measures, records for which are available onsite. BMPs have been listed on all building permit applications, as verified by City's Planning and Building Services. Chevron's compliance with this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
1a: All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12%. Moisture content can be verified by lab samples or moisture probe.						
1b: All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 miles per hour.					Y	See MM 4.3-1a.
1c: Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50% air porosity.					Y	See MM 4.3-1a.
1d: Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.					N/A	See MM 4.3-1a.
1e: The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.					Y	See MM 4.3-1a.
1f: All trucks and equipment, including their tires, shall be washed off prior to leaving the site.					Y	See MM 4.3-1a.
1g: Site accesses to a distance of 100 feet from the paved road shall be treated with a 6- to 12-inch compacted layer of wood chips, mulch, or gravel.					Y	See MM 4.3-1a.
1h: Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than 1%.					N/A	See MM 4.3-1a.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
1i: All haul trucks transporting soil, sand, or other loose material off-site shall be covered.					Y	See MM 4.3-1a.
1j: All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping shall be prohibited.					Y	See MM 4.3-1a.
1k: All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.					Y	See MM 4.3-1a.
1l: All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.					Y	See MM 4.3-1a.
1m: Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure, Title 13, Section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points.					Y	See MM 4.3-1a.
1n: All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.					Y	See MM 4.3-1a.
1o: A publicly visible sign shall be posted providing the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.					Y	See MM 4.3-1a.
4.3-2a: Chevron shall reduce construction-related NO_x emissions to less-than-significant levels by implementing one or more of the following feasible mitigation measures, all of which have been found to result in emissions reduction for construction projects: ▪ Using lower emitting construction equipment, increasing carpooling or otherwise reducing construction-worker automobile use in daily commutes, extending the duration of construction by 1 year by delaying the modifications required to increase the throughput capacity of the FCC FHT until after construction of the hydrogen plant and amine contactor, or reducing the hours of use of construction equipment;	Chevron / Project Contractor	During construction activities	Chevron, BAAQMD, and City of Richmond Building Division and Engineering Services Department	Review and verification, continuous during construction. Chevron shall submit for City review and verification quarterly mitigation measure compliance reports reasonably demonstrating compliance with this mitigation measure. Such reports shall be submitted to Building and reviewed	Y	Chevron submits quarterly construction emissions reports to the City pursuant to which Chevron anticipates that emissions of all criteria air pollutants (CAP) will be less than significant. See Attachment 3 for 2022 Quarterly Construction Emissions Reports. Chevron is implementing mitigation measures 4.3-2a and 2b and 4.8-1 to reduce construction-related CAP and GHG emissions, respectively, to the extent feasible. Implementation of these mitigation measures is verified pursuant to routine field audits conducted by Chevron, documentation of which is maintained onsite. Chevron reports on

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
▪ Reducing operations and/or emissions from portable generators at the Facility during the construction period, and thereby reducing NO_x emissions; ▪ Installing the low-NO_x burners included in the Modernization Project in the first 6 months of the construction period, thereby reducing net NO_x emissions from the Facility while construction of the Modernization Project continues; ▪ Retiring permanent NO_x emission reduction credits to offset this temporary NO_x construction increase, in an amount sufficient to offset construction period NO_x emissions; or ▪ Implementing a combination of two or more of the above measures, in an amount sufficient to offset construction-period NO_x emissions to less-than-significant levels.				and verified in consultation with BAAQMD.		implementation of these construction measures on a quarterly basis. See Attachment 3 for 2022 Quarterly Construction Questionnaires.
4.3-2b: Chevron shall reduce construction-related ROG emissions to less-than-significant levels by implementing one or more of the following feasible mitigation measures, all of which have been found to result in emissions reduction for construction projects: ▪ Installing the tank dome Project Design Feature, and installing one additional tank dome, in the first 6 months of Project construction, thereby reducing net ROG emissions from the Facility before completing construction of the hydrogen plant or sulfur removal components of the Modernization Project; ▪ Using lower emitting construction equipment, increasing carpooling or otherwise reducing construction-worker automobile use in daily commutes, extending the duration of construction by 1 year by delaying the modifications required to increase the throughput capacity of the FCC FHT until after construction of the hydrogen plant and amine contactor, or reducing the hours of use of construction equipment; ▪ Retiring permanent ROG emission reduction credits to offset this temporary ROG construction increase, in an amount sufficient to offset construction-period ROG emissions; or ▪ Implementing a combination of the above measures, in an amount sufficient to offset construction-period ROG emissions to less-than-significant levels.	Chevron / Project Contractor	During construction activities	Chevron, BAAQMD, and City of Richmond Building Division and Engineering Services Department	Review and verification, continuous during construction. Chevron shall submit for City review and verification, in consultation with BAAQMD, quarterly Mitigation measure compliance reports demonstrating compliance with this mitigation measure. Such reports shall be submitted to Building.	Y	See MM 4.3-2a and MM 4.3-5f.
4.3-5: Chevron shall implement feasible mitigation measures to reduce CAP emissions below applicable BAAQMD significance	Chevron	Immediately following 1-year	BAAQMD and City of Richmond	Verification of reduction in annual report and validation study prepared	Y	CAP emissions for year 2022 did not exceed Baseline levels. Thus, additional mitigation

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
thresholds and to ensure no net increase in Project CAP emissions over Baseline levels, as follows: 5a: NO_x Mitigation. Chevron shall implement the following measures in an amount sufficient to reduce NO_x emissions to below the BAAQMD NO_x significance threshold and to ensure no net increase in Project NO_x emissions above Baseline NO_x emission levels: (i) Chevron shall increase the average parcel size —the average ship cargo volume that is delivered or picked up from the Long Wharf— to reduce the number of ship calls, and thereby reduce NO_x emissions from shipping. (ii) Chevron shall fund and require installation of cleaner main and auxiliary engines on up to six tug boats serving the Long Wharf. Tugs are used to push barges, escort ships and barges, and assisting ships and barges into berths. Chevron shall fund the installation of new, cleaner Tier 4 main engines and Tier 3 auxiliary engines for the number of tugs required to remain below the BAAQMD NO_x significance threshold, and achieve the mandatory requirement that there be no net increase in Project NO_x emissions above Baseline NO_x emission levels. (iii) If, after implementing Mitigation Measures 4.3-5(a)(i) and 4.3-5(a)(ii), either Project NO_x emissions have not been reduced below the BAAQMD NO_x significance threshold, or if such emissions remain above Baseline levels on a net basis, then Chevron shall permanently retire BAAQMD-verified emission reduction credits in quantities sufficient to fully offset Project NO_x emissions to Baseline levels on a net basis. (iv) If, after implementing Mitigation Measure 4.3-5(a)(iii), above, Project NO_x emissions remain above Baseline levels on a net basis, then Chevron shall curtail Facility operations such that Project NO_x emissions are reduced to Baseline levels on a net basis.		exceedance of the Baseline and continuous thereafter	Building Division and Engineering Services Department	by Chevron and reviewed and verified by City, in consultation with BAAQMD, after 1-year exceedance of the Baseline and annually thereafter		measures were not triggered. See Attachment 9 for the Annual Operations Emissions Summary. Prior to commencement of Project operations, Chevron implemented several mitigation obligations, including: 1) funded and put into service a new tug boat, and 2) removed three SuezMax vessels from service and replaced them with two new SuezMax ships. Chevron's voluntary implementation of these mitigation obligations prior to commencement of Project operations had the benefit of reducing emissions compared to baseline earlier than required by this measure.
5b: PM_{10} Mitigation. Chevron shall implement the following feasible mitigation measures in an amount sufficient to reduce PM_{10} emissions to below the BAAQMD significance thresholds and to ensure no net increase in Project PM_{10} emissions above Baseline PM_{10} emission levels: (i) Chevron shall increase the size of the Fluid Catalytic Cracking Electrostatic Precipitator (ESP) by approximately 50% to eliminate	Chevron	Immediately following 1-year exceedance of the Baseline and	Chevron, BAAQMD, and City of Richmond Building Division and	Verification of reduction in annual report and validation study prepared by Chevron and reviewed and verified by City, in consultation with BAAQMD, after 1-year exceedance of	Y	See MM 4.3-5a.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
an existing NH_3 injection process in the flue gas in the Fluid Catalytic Cracking unit. (ii) If, after implementing Mitigation Measure 4.3-5b(i), above, PM_{10} emissions have not been reduced below the BAAQMD significance threshold, or if such emissions remain above Baseline levels on a net basis, then Chevron shall permanently retire BAAQMD-verified emission reduction credits in quantities sufficient to reduce Project PM_{10} emissions to Baseline levels on a net basis. (iii) If, after implementing Mitigation Measure 4.3-5(b)(ii), above, Project PM_{10} emissions remain above Baseline levels on a net basis, then Chevron shall curtail Facility operations such that Project PM_{10} emissions are reduced to Baseline levels on a net basis.		continuous thereafter	Engineering Services Department	the Baseline and annually thereafter		
5c: $PM_{2.5}$ Mitigation. Chevron shall reduce $PM_{2.5}$ emissions to below BAAQMD significance thresholds, and to emission levels that ensure no net increase in Project $PM_{2.5}$ emission above Baseline $PM_{2.5}$ emissions by implementing Mitigation Measure 4.3-5b (PM_{10}), which would also reduce $PM_{2.5}$ emissions. Additionally, Chevron shall complete a validation study quantifying the relative amount of $PM_{2.5}$ reductions achieved by Mitigation Measure 4.3-5b, for review and approval by BAAQMD and the City, to ensure that adequate quantities of $PM_{2.5}$ reductions are achieved as required by this Mitigation Measure 4.3-5c. Finally, Chevron shall implement Mitigation Measure 4.3-6, to reduce health risks from all TACs, including but not limited to $PM_{2.5}$, below the BAAQMD significance thresholds for cancer, and chronic or acute non-cancer risks, and as necessary to ensure no net increase in health risks from all TACs.	Chevron	Immediately following 1-year exceedance of the Baseline and continuous thereafter	Chevron, BAAQMD, and City of Richmond Building Division and Engineering Services Department	Verification of reduction in annual report and validation study prepared by Chevron and reviewed and verified by the City, in consultation with BAAQMD, after 1-year exceedance of the Baseline and annually thereafter	Y	See MM 4.3-5a.
5d: SO_x Mitigation. Chevron shall implement the following feasible mitigation measures in an amount sufficient to reduce SO_x emissions to below the BAAQMD significance threshold and to ensure no net increase in Project SO_x emissions above Baseline SO_x emissions : (i) Chevron shall increase the use of SO_x-reducing catalyst in the Fluid Catalytic Cracking unit that has been demonstrated to substantially reduce SO_x emissions in refinery flue gases. (ii) If, after implementing Mitigation Measure 4.3-5d(i), above, SO_x emissions have not been reduced below the BAAQMD significance threshold, or if such emissions remain above Baseline levels on a	Chevron	Immediately following 1-year exceedance of the Baseline and continuous thereafter	Chevron, BAAQMD, and City of Richmond Building Division and Engineering Services Department	Verification of reduction in annual report and validation study prepared by Chevron and reviewed and verified by the City, in consultation with BAAQMD, after 1-year exceedance of the Baseline and annually thereafter	Y	See MM 4.3-5a.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
net basis, then Chevron shall permanently retire BAAQMD-verified emission reduction credits in quantities sufficient to reduce Project SO_x emissions to Baseline levels on a net basis. (iii) If, after implementing Mitigation Measure 4.3-5(d)(ii), above, Project SO_x emissions remain above Baseline levels on a net basis, then Chevron shall curtail Facility operations such that Project SO_x emissions are reduced to Baseline levels on a net basis.						
5e: CO Mitigation. Chevron shall implement the following feasible mitigation measures to ensure no net increase in Project CO emissions above Baseline CO emission levels: (i) Chevron shall reduce CO emissions to achieve the mandatory requirement that there be no net increase in Project CO emissions above Baseline CO emissions by retiring BAAQMD-verified emission reduction credits in quantities sufficient to reduce Project CO emissions to Baseline levels on a net basis. Permanent retirement of emission reduction credits would ensure that these banked emissions cannot occur within Richmond or elsewhere. (ii) If, after implementing Mitigation Measure 4.3-5(e)(ii), above, Project CO emissions remain above Baseline levels on a net basis, then Chevron shall curtail Facility operations such that Project CO emissions are reduced to Baseline levels on a net basis.	Chevron	Immediately following any 1-year exceedance of the Baseline	Chevron, BAAQMD, and City of Richmond Building Division and Engineering Services Department	Verification of reduction in annual report and validation study prepared by Chevron and reviewed and approved by the City and BAAQMD, after 1-year exceedance of the Baseline and annually thereafter.	Y	See MM 4.3-5a.
5f: ROG Mitigation. Chevron shall complete the following feasible mitigation measures to reduce ROG emissions to below the BAAQMD significance thresholds and to ensure no net increase in Project ROG emissions above Baseline ROG emissions: (i) Prior to the commencement of Project operations, Chevron shall install a tank dome on Tank 3225; (ii) Within three years following the commencement of Project operations, Chevron shall install tank domes on Tanks 3189 and 3202; (iii) Following the third anniversary of the commencement of Project operations, Chevron shall install domes on one or more of the following tanks to reduce VOC emissions as necessary to reduce ROG emissions below the BAAQMD significance threshold, and to ensure no net increase in Project ROG emissions above Baseline ROG emissions: Tanks 1491, 3213, 3134, 1688, 1514, 3133, 3071, 992, 3197, 1687, 990, 991, 3073, 1296, 3191, 1287, 3220, 3127, 1488, 1459, 3180, 3074, 3076, 3193, 3128, 3201,	Chevron	Immediately following any 1-year exceedance of the Baseline and as specified in this measure 5f.	Chevron, BAAQMD, and City of Richmond Building Division and Engineering Services Department	Verification of reduction in annual report and validation study prepared by Chevron and reviewed and approved by the City and BAAQMD, after 1-year exceedance of the Baseline and annually thereafter.	Y	See MM 4.3-5a. Chevron completed installation of a dome on Tank 3225 prior to commencement of Project operations and on Tank 3202 in 2019. Construction of the dome on Tank 3189 commenced on February 15, 2021 and was completed in 1Q2022.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
and 3075. If, following Project approval, Chevron identifies feasible ROG reduction measures other than tank domes that result in quantified emissions reductions as verified by BAAQMD, City shall consider implementation of such alternative reduction measures in lieu of, or in combination with, the reduction measures required by this Mitigation Measure 4.3-5f(iii), provided that such measures have completed all required CEQA review and permitting processes prior to implementation (it is noted, however, that no such measures are currently identified, planned or approved for implementation.) (iv) If, after implementing Mitigation Measure 4.3-5f(i) through 4.3-5(iii), above, ROG emissions have not been reduced below the BAAQMD significance threshold, or if such emissions remain above Baseline levels on a net basis, then Chevron shall permanently retire BAAQMD-verified emission reduction credits in quantities sufficient to reduce Project ROG emissions to Baseline levels on a net basis. (v) If, after implementing Mitigation Measure 4.3-5(f)(ii), above, Project ROG emissions remain above Baseline levels on a net basis, then Chevron shall curtail Facility operations such that Project ROG emissions are reduced to Baseline levels on a net basis.						
5g: Supplemental Mitigation for all CAPs. In any year that Chevron exceeds Baseline emissions for any CAP, Chevron shall contribute funding for, and participate in, a Clean Air Improvement Fund, which funding shall be in addition to, and payment thereof shall in no way relieve Chevron or the Project of the requirement that the Project achieve no net increase in CAP emissions, as follows: ▪ Funding shall be in an amount determined based on a benchmark price to be agreed to by the City, BAAQMD and Chevron, as thereafter annually adjusted by the Consumer Price Index value for the San Francisco Bay Area. ▪ Funding shall be paid annually within 60 days following approval by BAAQMD of the Emission Inventory for the prior calendar year. ▪ All payments into the Clean Air Improvement Fund shall be spent on emission reduction measures for criteria pollutant(s) that increased above Baseline in the following order: (1) reductions from Facility emissions, (2) reductions within the	Chevron and City of Richmond	Immediately following any 1-year exceedance of the Baseline and as specified in this measure 5g.	Chevron, BAAQMD, and City of Richmond	Verification of reduction in annual report and validation study prepared by Chevron and reviewed and approved by the City and BAAQMD, after 1-year exceedance of the Baseline and annually thereafter.	N/A	See MM 4.3-5a.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
City, and (3) reductions from the North Richmond area closest to the Facility. ▪ Funding and implementation decisions shall be made in a public process by a stakeholder group consisting of representatives from the City, the community, and Chevron. ▪ A brief report shall be prepared for each major emission reduction measure implemented using such funds, and be made available to help inspire similar emission reduction opportunities. Mitigation Measure 4.3-5g would not create any exception to Chevron's obligation to fully comply with all mitigation measures included in this EIR, including but not limited to Mitigation Measure 4.3-6, which requires the Project to ensure no net increase of health risks over Baseline levels caused by all TAC emissions.						
5h. Chevron shall secure a permit amendment from BAAQMD reducing the annualized throughput limit of the Solvent De-asphalting unit to 50,000 barrels per day. This must be completed prior to commencing operation of the new hydrogen plant. 5i: Chevron shall secure a permit amendment from BAAQMD reducing the hydrogen production limit of each train of the new hydrogen plant from 140 mmscf/day to 122 mmscf/day. This must be completed prior to commencing operation of the new hydrogen plant.	Chevron	Prior to Project operations.	Chevron, BAAQMD, and City of Richmond	Prior to commencement of Project operations, Chevron shall submit for City review and verification substantial evidence of compliance with this measure.	Y	See CUP B2 in Table 1. Chevron has implemented this mitigation measure, and this measure will not be addressed in future annual reports. See CUP B7 in Table 1. Chevron has implemented this mitigation measure, and this measure will not be addressed in future annual reports.
4.3-6: Chevron shall implement the following measures: 6a1: Prior to operation of the Project, Chevron shall implement the following measures to reduce DPM, inclusive of $PM_{2.5}$, to reduce health risk from all Project TAC emissions to below BAAQMD significance criteria (for the 93% Project shipping scenario) and to ensure no net increase of health risks from Project TAC emissions over Baseline levels: (i) Chevron shall fund and require installation of cleaner main and auxiliary engines on one tug boat serving the Long Wharf as well as non-Chevron facilities. Prior to operation of the Project, Chevron shall fund the installation of new, cleaner Tier 4 main engines and Tier 3 auxiliary engines for one of the six tugboats. (ii) Chevron shall fund and cause to have implemented the project design feature described in the EIR as the removal of three ocean-going vessels (called "SuezMax" because they can go through the	Chevron	Prior to Project operations.	BAAQMD and City of Richmond Building Division and Engineering Services Department	Prior to the commencement of Project operation, Chevron shall submit for City and BAAQMD review and verification substantial evidence of compliance with this measure.	Y	Prior to commencement of Project operations, Chevron implemented several mitigation obligations, including: 1) funded and put into service a new tug boat, and 2) removed three SuezMax vessels from service and replaced them with two new SuezMax ships. Chevron's voluntary implementation of these mitigation obligations prior to commencement of Project operations had the benefit of reducing emissions compared to baseline earlier than required by this measure. The Project achieved the requirement for no net increase of health risks from TAC emissions over Baseline levels. Thus, additional mitigation measures were not triggered. See Attachment 9 for the Annual Operations Emissions Summary.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
existing Suez canal, and have cargo capacity of between 120,000 to 200,000 tons) from West Coast service, and replacement of these vessels with two new Chevron SuezMax ships. The main ship engines of each replacement ship shall meet a Tier 3 standard instead of the required Tier 2 standard, and the auxiliary engines shall be upgraded with turbochargers that are cleaner than Tier 3 standards.						
6a2: Prior to operating the Project in excess of 93% Project utilization, Chevron shall implement a combination of the following measures to reduce DPM, inclusive of $PM_{2.5}$, to reduce health risk from all Project TAC emissions to below BAAQMD significance criteria and to ensure no net increase of health risks from Project TAC emissions over Baseline levels, with all emission reduction amounts from such measures requiring validation by BAAQMD: (i) Chevron shall increase the average parcel size—the average ship cargo volume that is delivered or picked up from the Long Wharf—to reduce the number of ship calls, and thereby reduce DPM emissions from shipping. (ii) Chevron shall fund and require installation of cleaner main and auxiliary engines on up to five non-retrofitted six tug boat serving the Long Wharf as well as non-Chevron facilities. The Long Wharf is primarily served by six tugs, one of which will have been retrofitted as described in Mitigation Measure 4.3-a1(i) prior to Project operation. Chevron shall fund the installation of new, cleaner Tier 4 main engines and Tier 3 auxiliary engines on the number of tugs required to reduce DPM, and achieve the No Net Increase Project Objective. (iii) If, after implementing Mitigation Measures 4.3-6(a)(2)(i) and 4.3-6a(2)(ii), above, health risk from Project TAC emissions remains above Baseline levels on a net basis, as determined by the health risk assessment required by Mitigation Measure 4.3-6b, below, Chevron shall install electric shore power, and require one or more of the ships using the Long Wharf to use such shore power in lieu of continuing to burn diesel fuel while berthed. Before implementing this mitigation measure, Chevron shall apply to the City and other responsible agencies for necessary permits, and shall complete the environmental process required under CEQA.	Chevron	Prior to operating the Project in excess of 93% Project utilization.	Chevron, BAAQMD, and City of Richmond Building Division and Engineering Services Department	Verification in validation study prepared by Chevron and reviewed and approved by the City, in consultation with BAAQMD, following exceedance of baseline health risk from TACs and exceedance of the 93% Utilization level	Y	Chevron did not operate in excess of 93% Project utilization for year 2022. Chevron tracks utilization consistent with the methodology set forth in EIR Appendix 4.3-URM. For year 2022, Project utilization was less than 93%. Therefore, the other mitigation requirements under this measure were not triggered.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
Implementation of this measure is not required to achieve the performance standard included in this Mitigation Measure 4.3-6. (iv) If, after implementing Mitigation Measures 4.3-6(a)(2)(i) though 4.3-6a(2)(iii), above, health risk from Project TAC emissions remains above Baseline levels on a net basis, as determined by the health risk assessment required by Mitigation Measure 4.3-6b, below, then Chevron shall curtail Facility operations as necessary to ensure that such health risk is reduced to Baseline levels on a net basis.						
6b: Chevron shall fund and participate in a Clean Air Improvement Fund for any net increase in health risks from TACs not avoided or mitigated as required in this EIR. (i) In any year for which the BAAQMD-approved emissions inventory, combined with annual emission estimates from shipping, results in an increase over Baseline levels identified in Table 4.3-24 of the three primary risk drivers (DPM, benzene, and naphthalene), even if such emissions are adequately mitigated as CAP emissions through implementation of Mitigation Measure 4.3-5 such that there is no net increase of such CAP emissions over Baseline levels, then Chevron shall, within 60 days, fund the cost of the City's preparation of a new health risk assessment to identify whether these TAC emissions resulted in an increase in risk over Baseline. (ii) If the new risk assessment required by Mitigation Measure 4.3-6(b)(i), above identifies an increase in risk over Baseline risks, then Chevron shall contribute an additional $100,000 in further funding for the Clean Air Improvement Fund identified in this Mitigation Measure 4.3-6b.	Chevron	As specified in this measure.	Chevron, BAAQMD, and City of Richmond	Compliance with 6b(i) to be verified by City, in consultation with BAAQMD, within 60 days following issuance of the annual BAAQMD-approved emissions inventory, combined with annual emission estimates from shipping, for any year which results in an increase over Baseline levels. Compliance with 6b(ii), if applicable, to be verified within 30 days following City's receipt of the HRA as may be required by 6b(i).	N/A	See MM 4.3-6a.
6c: Chevron shall monitor designated metals in Facility feedstock and refinery fuel gas (RFG)–and report annually on the correlation, if any, between total annual designated metal emissions (as calculated from RFG samples) and average annual concentrations of such metals in feedstocks. The annual report shall address the following metals of concern: nickel, vanadium, selenium, cadmium, and mercury. Metals are TACs, and contribute to health risks, and any net increase in metal emissions would also trigger the mitigation	Chevron	Following start of Project operations and continuously thereafter.	Chevron, BAAQMD, and City of Richmond Planning Division	Chevron shall submit, and City shall review and verify required reports annually in consultation with BAAQMD. City shall, in consultation with BAAQMD, verify compliance with Mitigation Measures 4.3-6a and 4.3-6b, if such measures	Y	This mitigation measure requires Chevron to measure and report on metals in two different ways. First, it requires Chevron to monitor and review metals in facility feedstocks and fuel gas and report out on any correlation. Chevron has established a program to monitor designated metals in facility feedstocks and RFG. Second, this mitigation measure requires Chevron to verify that the specified metals emissions have resulted in no net increase in health risk compared with Baseline

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
measure compliance requirements in Mitigation Measures 4.3-6a and 4.3-6b, above.				triggered by this measure 4.3-6c.		levels. As reported in Attachment 11, Chevron satisfied this measure because the Project did not result in a net increase in health risk from designated metal emissions compared to Baseline; therefore, additional mitigation was not triggered. See Attachment 11: Feedstock and Emissions Monitoring Summary.
6d: Chevron shall monitor average annual sulfur and nitrogen concentrations in Facility feedstocks, and nitrogen-related refinery fuel gas air emissions, and report annually on the correlation, if any, between total annual nitrogen-related CAP and TAC emissions (as reported in the BAAQMD annual Emissions Inventory) and average annual concentrations of sulfur and nitrogen in feedstocks. Any such increase over Baseline would require compliance with mitigation measures specified above to ensure no net increase in CAPs or risks from TACs over Baseline levels.	Chevron	Annually	Chevron, BAAQMD, City of Richmond Building Division and Engineering Services Department	Chevron shall submit, and City shall review and verify required reports annually in consultation with BAAQMD.	Y	This mitigation measure requires Chevron to measure and report on nitrogen in two different ways. First, it requires Chevron to monitor and review nitrogen in facility feedstocks and report out on any correlation with nitrogen-related CAP and TAC emissions. Chevron has established a program to monitor nitrogen in facility feedstocks commensurate with this mitigation measure. Second, this mitigation measure requires Chevron to verify no net increase in nitrogen-related CAPs or risks from nitrogen-related TACs over Baseline levels. As reported in Attachment 11, Chevron satisfied this measure because the Project did not result in a net increase in nitrogen-related CAPs or net increase in health risks from nitrogen-related TACs compared to Baseline; therefore, additional mitigation was not triggered. See Attachment 11: Feedstock and Emissions Monitoring Summary.
4.3-7: Chevron shall implement Mitigation Measures 4.3-6a through 4.3-6d.	*See referenced Mitigation Measure.*					
4.3-8: Chevron shall implement the following measures: (a) Chevron shall report annually to the City in writing on the number of odor complaints confirmed by the BAAQMD, and shall specify in such report, where available, whether each complaint relates to hydrogen sulfide, NH_3, or an unspecified compound or source.	Chevron	Annually and in the event of an increase in odor complaints over the Baseline period	Chevron, BAAQMD, and City of Richmond Planning Division	City shall review reports annually and verify compliance, in consultation with BAAQMD	Y	See Attachment 10: 2022 Annual Odor Report.
(b) If, in any year following commencement of Project operations, there is an increase in odor complaints confirmed by the BAAQMD relative to the number of odor complaints that occurred during the	Chevron	Upon commenceme	Chevron, BAAQMD, and City of	Review and verification continuous during Project operations.	Y	The quantity of odor complaints confirmed by the BAAQMD in 2022 did not exceed the average annual number of odor complaints that occurred

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
Baseline period, and such increase is due to H_2S or NH_3 odors, Chevron shall prepare, and submit to the City and BAAQMD for approval, an Odor Management Plan. At minimum, the Odor Management Plan shall: ▪ Establish protocols for monitoring odors at or from the Facility on an ongoing basis; ▪ Provide for the establishment of a regular odor patrol to monitor odors at or from the Facility and to investigate, and take corrective actions with respect to, odor complaints on an ongoing basis; ▪ Establish protocols for the prompt recordation and annual reporting to City of odor complaints confirmed by BAAQMD; ▪ Establish community outreach protocols describing procedures for informing the public about how and where to submit odor complaints; ▪ Describe measures to be implemented as necessary to reduce BAAQMD-confirmed odor complaints below the BAAQMD threshold of significance, which measures shall include, but not be limited to, the following odor mitigation strategies recommended for refineries in the BAAQMD CEQA Guidelines (collectively, the "Odor Reduction Measures"): (i) implementation of water injections into the hydrocracking process; (ii) installation of vapor recovery systems; (iii) injection of masking odorants into refinery process streams; (iv) installation of flare meters and controls; (v) implementation of wastewater circulation technology for aerated ponds; (vi) implementation of thermal oxidizers; (vii) implementation of carbon absorption mechanisms; (viii) implementation of biofiltration and/or bio-trickling filters. ▪ Establish protocols for (1) the annual review and reporting on the effectiveness of any Odor Reduction Measures implemented pursuant to this Mitigation Measure 4.3-8 and (2) adaptively managing the implementation of Odor Reduction Measures as necessary to maintain complaints below the BAAQMD threshold of significance on an ongoing basis.		nt of Project operations.	Richmond Planning Division			during the Baseline period. Thus, this mitigation measure was not triggered. See Attachment 10 – Annual Odor Report.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
(c) If, in any year following commencement of Project operations, there is an increase in odor complaints confirmed by the BAAQMD relative to the number of odor complaints that occurred during the Baseline period, and such increase is due to H_2S or NH_3 odors, Chevron shall implement the odor patrol provided for under the Odor Management Plan and cause it to immediately commence monitoring odors at or from Facility on an ongoing basis, to investigate any odor complaint, to ensure that appropriate action is taken to reduce odors from the affected source, and to document the implementation and effectiveness of the corrective action.	Chevron	Upon start Project operations.	Chevron, BAAQMD, and City of Richmond Planning Division	Review and verification continuous during Project operations.	Y	See MM 4.3-8b.
(d) If odor complaints above Baseline levels persist for more than 2 consecutive years following commencement of Project operations, Chevron shall fund a qualified third-party engineering firm to assume responsibility for: ▪ Immediately investigating odor complaints confirmed by the BAAQMD in accordance with Odor Management Plan protocols; ▪ Implementing and adaptively managing, at Chevron's sole expense and in consultation with the City and the BAAQMD, one or more of the Odor Reduction Measures described in the approved Odor Management Plan, to reduce or maintain BAAQMD-confirmed odor complaints below the BAAQMD threshold of significance; ▪ Monitoring and documenting the implementation and effectiveness of such Odor Reduction Measures and the adaptive management thereof in accordance with Odor Management Plan protocols; and ▪ Annually reporting in writing to the City and the BAAQMD on the implementation and effectiveness of such Odor Reduction Measures and the adaptive management thereof in accordance with Odor Management Plan protocols.	Chevron	Upon start of Project operations.	Chevron, BAAQMD, and City of Richmond Planning Division	Review and verification continuous during Project operations.	Y	See MM 4.3-8b.
(e) Chevron shall cause the Project to comply with the City's odor standards and with BAAQMD Regulation 7-303, which limits the concentration of NH_3 from stacks to 5,000 ppm. The Facility heaters shall comply with the BAAQMD Permit Condition 24136, Item #16 limit of 10 ppm NH_3 at 3% oxygen in the stack, which is less than 5,000 ppm. Chevron shall further cause the Replacement Hydrogen Plant to comply with BAAQMD Regulations 7-303 for NH_3 at the other sulfur recovery units. Chevron shall confirm	Chevron	Upon start of Project operations.	Chevron, BAAQMD, and City of Richmond Planning Division	Review and verification continuous during Project operations.	Y	The Project complied with the City's odor standards. See Attachment 10: Annual Odor Report. Source tests of the new hydrogen plant and source tests of the modified SRU 1 and SRU 2 process plants demonstrate compliance with the 10 ppm NH3 limit in BAAQMD Permit Condition 24136 and the 5000ppm limit in BAAQMD

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
concentration of NH_3 in the stacks of both source categories after construction.						Regulation 7-303, respectively. Source test reports were submitted to the BAAQMD as required.
4.4 BIOLOGICAL RESOURCES						
4.4-1a: To avoid construction-related direct impacts (nest removal) or indirect impacts (increased noise levels) on nesting birds (including California Department of Fish and Wildlife (CDFW) Fully Protected Species and Species of Special Concern), one of the following measures shall be implemented: ▪ Conduct vegetation clearing and grubbing activities from September 1 through January 1, when birds (including raptors) are not likely to be nesting on the site; OR ▪ Conduct pre-construction surveys for nesting birds if construction is to take place during the nesting season (January 1 through August 31). A qualified wildlife biologist shall conduct a pre-construction nest survey no more than 5 days prior to initiation of construction activities (including vegetation clearing and grubbing) conducted within 300 feet of any vegetated area to provide confirmation of the presence or absence of active nests on or immediately adjacent to the storage tank dome Project Design Feature within the Tank Farm Area. If active nests are encountered, species-specific measures shall be prepared by a qualified biologist and implemented to prevent abandonment of the active nest. At a minimum, grading in the vicinity of the nest shall be deferred until the young birds have fledged. A minimum exclusion buffer of 50 feet (300 feet or more for raptors) shall be maintained during construction, depending on the species and location. The perimeter of the nest-setback zone shall be fenced or adequately demarcated with staked flagging at 20-foot intervals, and construction personnel and activities would be restricted in the area. A survey report by a qualified biologist verifying that (1) no active nests are present, or (2) the young have fledged, shall be submitted to the City and CDFW prior to initiation of grading in the nest-setback zone. The qualified biologist shall serve as a construction monitor during those periods when construction activities occur near active nest areas to ensure that no inadvertent impacts to these nests occur.	Chevron / Project Contractor	No more than 5 days prior to initiation of construction activities (including vegetation clearing and grubbing) (if required)	City of Richmond Planning and Building Services Department / Biologist	Review of pre-construction survey prior to initiation of construction by Planning; review of buffer design and implementation, once prior to construction and throughout the construction period by Building; review survey report prior to initiation of grading in the nest-setback zone (if required) by Planning & Building	Y	Biological survey reports prepared on behalf of the Project are maintained at the Refinery, and available for review by the City of Richmond onsite. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
4.4-1b: One of the following mitigation measures shall be implemented to lessen potential impacts on potential roost habitat and bat species: ▪ Construction activities near bat roost habitat or removal of potential bat roost habitat shall commence between September and October in order to avoid both the bat maternity period and the bat hibernation period; OR ▪ If this is not feasible, pre-construction bat roost surveys shall be conducted prior to removal of potential roost habitat. Pre-construction surveys for potential bat roost habitat shall be performed in all trees and buildings subject to removal or demolition for evidence of bat use (guano accumulation, acoustic or visual detections). If evidence is found, then acoustic surveys shall be conducted to determine whether a site is occupied. A minimum of three acoustic surveys shall be conducted in areas containing evidence of bat use between April and November under appropriate conditions using an acoustic detector (WBWG, 2002). If necessary, and with approval from CDFW, exclusion of bats from occupied roosts shall be performed in the fall prior to construction. A qualified wildlife biologist shall be present during exclusion.	Chevron / Project Contractor	Prior to removal of potential roost habitat (if required)	City of Richmond Planning & Building Services Department / Biologist	Review of pre-construction survey prior to initiation of construction by Planning; review of acoustic surveys prior to construction (if required) by Planning	Y	The biological survey reports prepared on behalf of the Project are maintained at the Refinery, and available for review by the City of Richmond onsite. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
4.4-1c: One of the following mitigation measures shall be implemented to lessen potential impacts on potential winter roost habitat for Monarch butterfly: ▪ Conduct tree removal when Monarch butterflies are not present (typically between March 31 and August 31); OR ▪ If conducting tree removal between March 31 and August 31 is not feasible, pre-construction Monarch butterfly roost surveys shall be conducted by a City-approved biologist within 100 feet of the storage tank dome Project Design Feature prior to initiation of any tree removal activities. If any winter roosts are encountered during the survey, construction shall be postponed until the roosting activity has ended. A follow-up survey shall be conducted by an approved biologist prior to construction in order to verify that the roosts have been vacated.	Chevron / Project Contractor	Prior to initiation of any tree removal activities and prior to construction (if required)	City of Richmond Planning & Building Services Department / Biologist	Review of pre-construction survey prior to any tree removal activities by Planning; review follow-up survey prior to construction by Planning & Building	Y	Biological survey reports prepared on behalf of the Project are maintained at the Refinery, and available for review by the City of Richmond onsite. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
4.5 CULTURAL RESOURCES						
4.5-1: In the event that any prehistoric or historic subsurface cultural resources, such as structural features or unusual amounts of bone or shell, artifacts, human remains, architectural remains (such as bricks or other foundation elements), or historic archaeological artifacts (such as antique glass bottles, ceramics, horseshoes, etc.), are discovered during ground-disturbing activities, all work within 50 feet of the resources shall be halted and Chevron and/or the lead agency shall consult with a qualified archaeologist to assess the significance of the find per CEQA Guidelines Section 15064.5. If any find is determined to be significant, representatives of Chevron and/or the lead agency and the qualified archaeologist shall meet to determine the appropriate avoidance measures or other appropriate mitigation, with the ultimate determination to be made by the lead agency. All significant cultural materials recovered shall be, as necessary and at the discretion of the consulting archaeologist, subject to scientific analysis, professional museum curation, and documented according to current professional standards. As part of the Mitigation Monitoring and Reporting Program for the EIR, Chevron shall have environmental monitors on-site during Modernization Project actions that involve ground-disturbing construction. The construction workers shall be trained by the monitors on environmental sensitivity and the identification of prehistoric or historic subsurface cultural resources. In considering any suggested mitigation proposed by the consulting archaeologist to mitigate impacts to historical resources or unique archaeological resources, the lead agency shall determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, Project design, costs, and other considerations. If avoidance is infeasible, other appropriate measures (e.g., data recovery) shall be instituted. Work may proceed on other parts of the Project site while mitigation for historical resources or unique archaeological resources is carried out.	Chevron / Project Contractor	During construction activities	City of Richmond Planning Division/ Archaeologist	Review and verification, continuous during construction	Y	No prehistoric or historic subsurface cultural resources have been discovered during ground disturbing activities on the Project site. On-site environmental monitors were present during ground-disturbing construction. Construction workers whose job responsibilities included ground disturbing activities were trained by Chevron on environmental sensitivity and the identification of prehistoric or historic subsurface cultural resources. Chevron included this training obligations in its "Instruction to Contractors." Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
4.5-2: In the event of unanticipated paleontological discoveries, such as large deposits of fossil remains, Chevron shall notify a qualified paleontologist who shall document the discovery as	Chevron / Project Contractor	During construction activities	Chevron and City of Richmond	Review and verification, continuous during construction	Y	No unanticipated paleontological discoveries have been made during construction activities on the Project site. On-site environmental monitors were

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
needed, evaluate the potential resource, and assess the significance of the find under the criteria set forth in CEQA Guidelines Section 15064.5. In the event of an unanticipated discovery of a brea, true, and/or trace fossil during construction, excavations within 50 feet of the find shall be temporarily halted or diverted until the discovery is examined by a qualified paleontologist per Society of Vertebrate Paleontology standards (SVP, 1995). The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction is allowed to resume at the location of the find. If the lead agency determines that avoidance is not feasible, the paleontologist shall prepare an excavation plan for mitigating the impact of the Modernization Project on the qualities that make the resource important, and such plan shall be implemented. The plan shall be submitted to the lead agency for review and approval. As part of the Mitigation Monitoring and Reporting Program for the EIR, Chevron shall have environmental monitors on-site during Modernization Project actions that involve ground-disturbing construction. The construction workers shall be trained by the monitors on environmental sensitivity and the identification of prehistoric or historic subsurface cultural resources.			Planning Division/ Paleontologist			present during ground-disturbing construction. Construction workers whose job responsibilities included ground disturbing activities were trained by Chevron on environmental sensitivity and the identification of prehistoric or historic subsurface cultural resources. Chevron included this training obligations in its "Instruction to Contractors." Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
4.5-3: In the event that human skeletal remains are uncovered during construction activities for the Modernization Project, Chevron shall immediately halt work, contact the Contra Costa County Coroner to evaluate the remains, and follow the procedures and protocols pursuant to Section 15064.5 (e)(1) of the CEQA Guidelines. If the County coroner determines that the remains are Native American, Chevron shall contact the NAHC, in accordance with Health and Safety Code Section 7050.5, subdivision (c), and Public Resources Code 5097.98 (as amended by Assembly Bill 2641). Per Public Resources Code 5097.98, the landowner shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located is not damaged or disturbed by further development activity until the landowner has discussed and conferred, as prescribed in this section (Public Resources Code 5097.98), with the most likely descendants regarding their	Chevron / Project Contractor	During construction activities	Chevron and City of Richmond Planning Division/ Archaeologist	Review and verification, continuous during construction	Y	No human skeletal remains have been discovered during construction activities on the Project site. Chevron included these training obligations in its "Instruction to Contractors." Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
recommendations, if applicable, taking into account the possibility of multiple human remains.						
4.6 ENERGY						
Construction or operation of the Project would result in no-significant impacts related to energy. No mitigation is required or recommended.						
4.7 GEOLOGY, SOILS, SEISMICITY AND MINERAL RESOURCES						
Construction or operation of the Project would result in no-significant impacts related to geology, soils, seismicity and mineral resources. No mitigation is required or recommended.						
4.8 GREENHOUSE GAS EMISSIONS						
4.8-1: Consistent with air quality mitigation measures for construction activities, Chevron would be required to implement the following mitigation measures to reduce its Project construction emissions. Implementation of the mitigation measures would result in further reductions in greenhouse gas emissions. 1a: All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph). 1b: Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxic Control Measure (Title 13 of California Code of Regulations [CCR], Section 2485). Clear signage shall be provided for construction workers at all access points. 1c: All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator. 1d: The idling time of diesel-powered construction equipment shall be limited to 2 minutes.	Chevron / Project Contractor	During construction	Chevron, BAAQMD, and City of Richmond Planning & Building Services Department	Review and verification, regularly during construction. Chevron shall submit for City review and verification quarterly compliance reports reasonably demonstrating compliance with this measure. Such reports shall be submitted to Building and reviewed and verified in consultation with BAAQMD.	Y	Chevron has issued "Instructions to Contractors" specifying implementation of requirements 4.8-1a through 1k. See Transmittal #6 to City of Richmond on February 2, 2016. Chevron conducts routine field audits to verify the contractors are appropriately implementing these measures, records for which are available onsite. For purposes of measure 1e, Chevron uses the data concerning engines provided by the contractors to independently verify that the fleet average meets this measure. This evaluation is available on site for review. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
1e: The Project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in construction (i.e., owned, leased, and subcontractor vehicles) would achieve a Project-wide fleet-average 20% nitrogen oxide reduction and 45% particulate matter reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission					Y	See MM 4.8-1a.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available. (Several of these measures would also reduce greenhouse gas emissions.) 1f: All contractors shall be required to use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines. 1g: Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard). 1h: Enforce and follow limits on idling time for commercial vehicles, including delivery and construction vehicles. 1i: Using alternative fueled (e.g., biodiesel, electric) construction vehicles/equipment on at least 15% of the fleet. 1j: Using local building materials of at least 10%. 1k: Recycling or reusing at least 50% of construction waste or demolition materials.					Y Y Y Y	See MM 4.8-1a. See MM 4.8-1a. See MM 4.8-1a. See MM 4.8-1a.
1l: For each year of Project construction, Chevron shall hire, at commercially reasonable rates and at Chevron's expense, a qualified third-party entity reasonably acceptable to the City to quantify and verify in writing whether the reductions achieved from the above described construction greenhouse gas mitigation measures for that year of Project construction adequately mitigated this potentially significant impact, which report shall be subject to City's reasonable approval. For any year of construction for which construction-related diesel emissions are not reduced to or below the 10,000-MT CO_2e per year significance threshold, Chevron shall implement one or more of the following measures in an amount sufficient to reduce construction period greenhouse gas emissions to less than significant levels: (i) Reduce diesel emissions from other equipment at the Facility, such as a diesel-powered generator, in an amount equal to the construction-related greenhouse gas emissions in excess of 10,000 MT CO_2e per year for any calendar year of Project construction, which reduced emission level Chevron shall maintain for the following 2 years. (ii) Permanently retire, or retrofit from diesel to electric power, one	Chevron / Project Contractor	Annually, as specified in this measure.	Chevron, BAAQMD, and City of Richmond Engineering Services Department	Review of annual construction emissions reports and verification, in consultation with BAAQMD, of compliance additional measures if significance threshold is exceeded	Y	Construction-related GHG emissions for year 2022 did not exceed the significance threshold. Thus, additional mitigation measures were not triggered. See Attachment 5.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
or more Facility sources that emit more than 300 MT CO_2e per year.						
As explained in the Draft EIR, Page 4.8-53, in the event the City selects the 2MW-solar project contemplated by the EIR as a potential Community Greenhouse Gas Reduction Program (CGRP) and such solar project is funded all or in part with funds required by Mitigation Measure 2.8-2e below, then, City shall ensure implementation of CGRP Solar Mitigation Measure Haz-1, Haz-2, Bio-1 and Bio-2 described in Section 4.8 of the EIR as follows: CGRP Solar Project Mitigation Measure Haz-1: Prior to commencing construction of the solar project, Chevron shall submit for City and RWQCB review the design of the facility, and sufficient information about construction and operational parameters as are determined by the City and/or RWQCB to be needed to assure that the solar project would not reduce the effectiveness of the remediation measures implemented in the solar site area. CGRP Solar Project Mitigation Measure Haz-2: Prior to commencing construction of the solar project, Chevron shall update the Facility emergency response and evacuation plans to account for the presence of the solar site on the Facility, and to assure that the modified emergency response and evacuation plans remain effective given the presence of the solar project. CGRP Solar Project Mitigation Measure Bio-1: Standard construction BMPs and specific Project Design Features shall be implemented to treat and minimize discharge of soil and pollutants into the marsh and other off-site vegetated areas during construction and operation of the proposed project. Standard construction BMPs shall be implemented according to a Stormwater Pollution Prevention Plan required under the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit). Catch basin inlet protection and installation of straw wattles (fiber rolls) shall be used throughout the Project site during construction. Additional construction BMPs required by the Regional Water Quality Control Board and San Francisco Bay Conservation and Development Commission shall also be implemented. Potential impacts on the	Solar Project Developer/City of Richmond Planning & Building Services Department	Prior to and during construction of solar project	City of Richmond Planning & Building Services Department	Verification prior to and during construction of solar project –Protection measures and areas shall also be included in the Plans submitted for grading and/or construction permits	N/A	Chevron and the City elected not to implement the solar project contemplated by this mitigation measure. Instead, Chevron leased the subject land to Marin Clean Energy (MCE), an independent public agency, to develop a larger commercial solar project. MCE constructed and is operating the project on Chevron-owned land, as provided for in the Economic and Community Investment Agreement (ECIA) entered into by and between Chevron and the City on July 29, 2014. Construction of the nominal 10.5MW MCE Solar One has been completed and the facility is currently operating. MCE prepared its own EIR for the Solar One project, which included its own mitigation monitoring and reporting program (MMRP) that incorporated mitigation measures from the Modernization Project EIR. The City of Richmond reviewed and commented on this EIR. Ultimately, Chevron had no authority to implement mitigation measures on the Solar One project site. **No further updates will be provided concerning this measure.**

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
coastal brackish marsh during construction activities shall also be avoided by placement of exclusion fencing 5-10 feet from the perimeter of the coastal brackish marsh boundary or on the edge of the temporary disturbance area when this distance is greater. The Facility shall provide environmental awareness training for all construction personnel, bright-colored fencing and signage shall identify and restrict construction within environmentally sensitive areas, and a construction monitor/environmental inspector shall confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements shall be completed immediately.						
CGRP Solar Project Mitigation Measure Bio-2: To avoid inadvertent construction impacts on salt marsh harvest mouse, Suisun ornate shrew, saltmarsh wandering shrew, and San Pablo vole, a qualified biological monitor shall be present during initial clearing and grubbing activities prior to installation of solar panel arrays in the vicinity of Herman's Slough. The monitor shall pre-survey disturbance areas to confirm the absence of special-status small mammals. Contractor education shall include a section specific to species identification and protection measures. The entire project construction area abutting coasts brackish marsh habitats shall be surrounded by exclusion fencing. Fencing installed around the project disturbance area during construction shall be adequate to exclude these species. A maximum speed limit of 25 mph shall be observed by construction and maintenance vehicles. The Facility shall provide environmental awareness training for all construction personnel, bright-colored fencing and signage shall identify and restrict construction within environmentally sensitive areas, and a construction monitor/environmental inspector shall confirm the fence integrity on a daily basis to protect the area from accidental equipment damage. Fence repair and/or reinforcements shall be completed immediately.	Solar Project Developer	Prior to and during construction of solar project	City of Richmond Planning & Building Services Department / Biologist	Verification prior to and during construction of solar project	N/A	See Bio-1 above. **No further updates will be provided concerning this measure.**
4.8-2: Chevron shall implement subsections 2a through 2f below. If implementation of subsections 2a through 2f, below, does not reduce Facility greenhouse gas emissions to Baseline levels on an annual net basis, then Chevron shall implement subsection 2g, below. If implementation of subsections 2a through 2g, below, does not reduce Facility greenhouse gas emissions to Baseline	Chevron / Project Contractor	Mitigation Measures 4.8-2a though 2c shall be implemented prior to	City of Richmond Planning & Building Services Department	Verification prior to completion of construction	Y	Pursuant to an August 2018 agreement with the City of Richmond, Chevron has implemented the Stripped Sour Water Reuse/Distillation and Reforming Area Project prior to commencement of Project operations. In lieu of the Sour Water Reuse in South Isomax Area Project, Chevron agreed to

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
levels on an annual net basis, then Chevron shall implement subsection 2h, below: 2a: Implement water conservation measures during Modernization Project construction; 2b: Install LED Lighting at the Facility during Modernization Project construction; 2c: Implement fluid catalytic cracker cooling water tower motor upgrades during Modernization Project construction;		Project operation.				fund a GHG reduction project within the City of Richmond, to be identified by the City, that would result in a reduction of at least 24 MT CO2e per year, which is the equivalent GHG reductions which would have been achieved through the implementation of the Sour Water Reuse in South Isomax Area Project. This project has been identified by the City. Chevron has provided funding. Chevron has completed the required 6,000 outdoor LED lights replacement netting a GHG emission reduction >339MT CO2e a year. Pursuant to an August 2018 agreement with the City of Richmond, the City of Richmond and Chevron have determined that the GHG emissions reductions thought to be achieved through implementation of this measure are uncertain. In lieu of this measure, Chevron has provided funding for a GHG project within the City of Richmond, that will result in a reduction of at least 576 MT CO2e per year.
2d: Participate, for Chevron Commercial Facilities (and industrial accounts, if practicable), in the Marin Clean Energy Program prior to commencement of construction;	Chevron	Prior to construction	City of Richmond Planning & Environ. Initiatives	Review and verification prior to commencement of construction	Y	Chevron has participated in the Marin Clean Energy Program for commercial facilities since September 2013. See Transmittal #15 to the City of Richmond on June 6, 2016.
2e: Provide $30M over ten years in funding for implementation of the Community Greenhouse Gas Reduction Measures, which measures shall be selected by the City through a public process with input from stakeholders from the City, North Richmond, and Chevron, as described above;	Chevron	Annually for 10 years beginning with issuance of first building permit of Hydrogen	City of Richmond City Manager's Office	Review and verification annually	Y	Chevron has made the first eight (8) payments pursuant to this obligation. The eighth payment was made in June 2022.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
		Plant Replacement				
2f: Acquiring and timely surrender to CARB Cap and Trade Emission Allowances in quantities sufficient to reduce Facility greenhouse gas emissions to or below Baseline levels on a net basis (rounded up to the nearest metric ton), after taking into account reductions achieved by Mitigation Measures 2a-2~~e~~e above;	Chevron	In accordance with the Facility's compliance obligation schedule pursuant to CARB cap-and-trade regulations (Cal Code Regs., tit, 17, § 95800 et seq.)	Chevron / City of Richmond Planning Services & Building / BAAQMD	Review annually and verification in accordance with the Facility's compliance obligation schedule pursuant to CARB cap-and-trade regulations (Cal Code Regs., tit, 17, § 95800 et seq.)	N/A	Chevron complies with CUP Condition B12 limiting greenhouse gas emissions to 4,602,947 metric tons (MT) per year, which supersedes this mitigation measure for purposes of compliance. See Attachment 9: Annual Operations Emissions Summary. **No further updates will be provided concerning this mitigation measure.**
2g: Acquire greenhouse gas reduction credits through the California Air Pollution Control Officers Association (CAPCOA) GHG Rx credit exchange, or through a similar exchange certified by BAAQMD or CARB, in quantities sufficient to reduce Facility greenhouse gas emissions to or below Baseline levels on a net basis (rounded up to the nearest metric ton), after taking into account reductions achieved by Mitigation Measures 2a-2e above, and after taking into account net reductions achieved by Mitigation Measure 2f above; 2h: Curtail facility operations such that Facility greenhouse gas emissions are reduced to or below Baseline levels on a net basis (rounded up to the nearest metric ton), after taking into account reductions achieved by Mitigation Measures 2a-2e above, and after taking into account net reductions achieved by Mitigation Measures 2f-2g above.	Chevron	In accordance with EIR Section 4.8.4.1.2.3.3.2.	Chevron / City of Richmond Planning Services & Building / BAAQMD	Review annually and verification in accordance with schedule and process described in EIR Section 4.8.4.1.2.3.3.2.	N/A	See 4.8-2f.
4.8-2B: *Clean Air Improvement Fund.* Chevron shall fund and participate in a Clean Air Improvement Fund for any Facility greenhouse gas emissions over Baseline. ▪ Funding shall be in an amount equivalent to the difference between Project and Baseline greenhouse gas emissions (in MT CO_2e) multiplied by the settlement price of greenhouse gas emission allowances determined at the 1st quarter 2014	Chevron	In accordance with EIR Section 4.8.4.1.2.3.3.2.	Chevron / City of Richmond Planning Services & Building Department	Review and verification annually following in accordance with schedule and process described in EIR Section 4.8.4.1.2.3.3.2.	N/A	See 4.8-2f.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
California Air Resources Board (CARB) auction, annually adjusted by the Consumer Price Index value for the San Francisco Bay Area. The difference between Project and Baseline greenhouse gas emissions shall be determined in accordance with the procedures for determining the Remaining Offset described above in *Section 4.8.4.1.2.3.3.2*. ▪ Funding shall be paid annually and in accordance with the procedures described above in *Section 4.8.4.1.2.3.3.2*. ▪ Funding shall be spent on greenhouse gas emission reduction measures in the following priority order: (1) reductions from Facility emissions; (2) reductions within the City; and (3) reductions from the North Richmond area closest to the Facility. ▪ Funding and implementation decisions shall be made by the City, as part of a public process, with input from stakeholders including representatives from the City, North Richmond, and Chevron. ▪ A brief report shall be prepared for each major emission reduction measure implemented using such funds, and be made available to help inspire other emission reduction opportunities.						
4.9 HYDROLOGY AND WATER QUALITY						
4.9-1a: Chevron shall prepare and submit a SWPPP to the RWQCB that includes best management practices to treat stormwater runoff during the construction period (and achieve water quality objectives) at least 10 days prior to commencement of construction activities. The BMPs included in the SWPPP shall be implemented during construction.	Chevron / Project Contractor	At least 10 days prior to construction	City of Richmond Building Division and Engineering Services / Hydrologist	Review and approval prior to construction, and verification during construction	Y	Chevron submitted a SWPPP to the RWQCB on September 1, 2015, and submitted documentation of that submittal to the City of Richmond on March 25, 2016. Chevron implemented all applicable BMPs during construction. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
4.9-1b: Chevron shall implement two Project Design Features (Stripped Sour Water Reuse/Distillation and Reforming Area and Stripped Sour Water Reuse in South Isomax Area) to offset average annual process wastewater flows under the 93% Utilization Scenario.	Chevron	Prior to start of Project operations	City of Richmond Building Division and Engineering Services / Hydrologist	Review and verification, continuous during construction	Y	Pursuant to an August 2018 agreement with the City of Richmond, Chevron has implemented the Stripped Sour Water Reuse/Distillation and Reforming Area Project prior to commencement of Project operations, which Chevron projects will result in a 75 million gallon per year reduction in wastewater compared to the EIR baseline. Since this reduction is greater than the net reduction of 15 million gallons per year in comparison to the EIR baseline analyzed in the EIR, no further action is necessary. Chevron did not operate in excess of 93% Utilization. See MM 4.3-6a2.
4.9-1c: If the Modernization Project increases wastewater generation above the 93% Utilization Scenario, any increases in wastewater generation shall be offset by implementation of addition water reuse projects, which may include (1) reuse of stripped sour water from 8 and 18 plants to supply wash water for the FCC FHT and hydrocracker located in the North Isomax area; and (2) reuse stripped sour water from 8 and 18 plants to supply wash water for lube crackers in the Richmond lube oil plant area. Additional or alternative stripped sour water reuse measures could also be implemented to assure no net increase in wastewater generation with City approval.	Chevron	Immediately following any increase in utilization above the 93% scenario	City of Richmond Building Division and Engineering Services / Hydrologist	Review and verification, once after new hydrogen plant is fully operational and at least annually thereafter	N/A	See MM 4.9-1b.
4.9-2: Any stockpiles of soils containing contaminants generated under the Modernization Project shall be covered with plastic sheeting to ensure that sediments and pollutants are not entrained in runoff or infiltrated into the subsurface during rainfall events. Reuse or disposal of contaminated soils shall be completed in accordance with applicable laws and regulations. If the soil is a hazardous waste, it shall be disposed of off-site at a licensed facility within 90 days of generation.	Chevron / Project Contractor	During construction; within 90 days of hazardous waste generation (if required)	City of Richmond Building Division and Engineering Services / Hydrologist	Review and verification, continuous during construction	Y	Chevron has issued "Instructions to Contractors" that specifies implementation of this requirement. See Transmittal #6 to City of Richmond on February 2, 2016. Chevron conducts routine field audits to confirm that contractors comply with BMPs WM-3 Stockpile Management, WM-7 Contaminated Soil Management, and CCR Title 22, Division 4.5 Standards for the Management of Hazardous Wastes. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
4.9-7: Within five years, Chevron shall retain qualified professionals to develop a Facility flood contingency plan that addresses all types of coastal flooding (i.e., storm-related flooding, extreme high tides, and tsunamis) and how these coastal flooding hazards will increase over time due to sea level rise. The contingency plan shall be submitted to the City of Richmond for review and approval.	Chevron / Project Contractor	Within 5 years of completion of construction	City of Richmond Planning & Building Services and Engineering Services / Hydrologist	Review and approval of contingency plan	Y	Chevron is progressing work for the Facility flood contingency plan which is due to the City by April 2024.
4.10 LAND USE, PLANS, AND POLICIES						
Construction or operation of the Project would result in no-significant impacts related to land use, plans and policies. No mitigation is required or recommended.						
4.11 NOISE						
4.11-1a: If nighttime construction is required, no pile driving shall be allowed and the types and intensity of any construction activities shall be limited to ensure noise generation does not exceed the City's nighttime noise limit of 50 dBA or cause an increase greater than 5 dBA.	Chevron / Project Contractor	During nighttime construction activities	City of Richmond Building Division	Verification, continuous during nighttime construction	Y	Nighttime construction activities are limited to bolt-up and welding of pipe and steel, electrical work, and scaffolding building. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
4.11-1b: If nighttime construction is required and the City of Richmond or the construction compliance and complaint manager receive verified complaints due to noise from the use of backup alarms, Chevron shall implement feasible measures to reduce this noise at the Facility boundary. Measures may include the use of alarms with ambient sensing/broadband technology instead of the traditional fixed level/ narrowband alarms or the use of administrative controls such as using a spotter or flagger and prohibiting all foot traffic in the work area.	Chevron / Project Contractor	During nighttime construction activities	Chevron and City of Richmond Planning & Building Services Department	Verification, continuous during nighttime construction	Y	No noise complaints have been received by the City of Richmond or Chevron regarding nighttime construction during the construction period. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
4.12 EMPLOYMENT, POPULATION, AND HOUSING						
Construction or operation of the Project would result in no-significant impacts related to employment, population or housing. No mitigation is required or recommended.						

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
4.13 PUBLIC SAFETY						
4.13-2a: Store hazardous materials for Modernization Project construction activities only in the construction staging locations identified in Figure 3-1 (*Chapter 3, Project Description*) unless an alternate location within a previously developed portion of the Facility is approved as part of the building permit approval process.	Chevron / Project Contractor	During construction	Chevron and City of Richmond Building Division	Verification, continuous during construction	Y	Hazardous materials are stored within approved locations as identified within Figure 3-1 of the EIR. Small quantities of consumer products that might be classified as hazardous materials are also stored in OSHA-regulated cabinets located within construction areas where the City-approved construction activities are occurring. All construction activities are subject to the requirements of City issued building permits. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
4.13-2b: Implement worker training and safety requirements for construction workers, including emergency response and hot work and contractor refinery instructions as more fully described in *Section 4.13.2.3* and *Appendix 4.13-DET*, and report training and implementation of safety requirements monthly to the City during construction and demolition activities. Communicate location and scope of Modernization Project-related construction activities weekly to City and Facility management to avoid any conflicts between construction and refining activities. The required implementation will include the new Leak Response Protocol developed since August 2012 (Chevron, 2012a).	Chevron / Project Contractor	Prior to construction, and weekly and monthly during construction and demolition	Chevron and City of Richmond Building Division and Fire Prevention Bureau	Review monthly reports and weekly communication during construction	Y	Chevron implemented worker training and safety requirements for construction workers. Since construction began, Chevron trained upwards of 2,000 workers. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
4.13-3a: Demolition and other construction wastes, and hazardous wastes, must be stored only in Facility locations approved by the City.	Chevron / Project Contractor	Prior to construction and during construction and demolition	Chevron and City of Richmond Building Division And Fire Prevention Bureau	Review and approval during construction and demolition	Y	Chevron developed a "Waste Diversion Plan/Debris Recovery Plan" (Plan) that identifies acceptable waste storage locations. The Plan was approved by the City of Richmond on May 17, 2016 and is attached to the "Instructions to Contractors." Contractors have been trained on the Plan and are responsible for complying with all of its provisions. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
4.13-3b: Hazardous wastes must be transported off-site to an authorized disposal, treatment, or recycling facility by a transportation company with appropriate federal and state transporter licenses within 90 days after the wastes are generated.	Chevron / Project Contractor	Prior to construction and during construction	Chevron and City of Richmond	Review and approval during construction and demolition	Y	See MM 4.13-3a.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
		and demolition	Building Division			
4.13-3c: Non-hazardous demolition and construction waste must be transported off-site to an authorized disposal, recycling, or reuse facility by a transportation company with required transporter licenses within 180 days after the wastes are generated.	Chevron / Project Contractor	Within 180 days of waste generated during construction and demolition	Chevron and City of Richmond Building Division	Verification continuous during and 180 days after completion of construction and demolition	Y	See MM 4.13-3a.
4.13-4a: Chevron will implement its Modernization Project Reliability Program (*Appendix 4.13-PROG*) including updating the detailed PHAs prepared for the 2008 Project for all new and modified Modernization Project components, which shall include ISSAs, damage mechanism reviews, and evaluation of the consequences thereof resulting from the Project, and LOPA, as part of these PHAs, prior to recommencement of construction of the Modernization Project, and again post-construction but before startup of Project operations for any changes that arise during construction that may affect the earlier PHAs, ISSAs, and LOPAs. Chevron will notify CCHS and the City of the availability of these PHAs, and make these PHAs available for review by CCHS and the City**.** The PHAs (initial and updates/revalidations), ISSAs, damage mechanisms reviews, and LOPAs shall be consistent with (proposed) amendments to the RISO. Chevron shall conduct the LOPAs and submit written LOPA reports, prepared in accordance with industry best practices (such as those issued by the Center for Chemical Process Safety) to CCHS and the City for review prior to construction (and post-construction, for those LOPAs warranting changes based on changes that arise during construction). CCHS will work with the City in implementing these and other Public Safety mitigation measures.	Chevron / Project Contractor	Prior to construction and again post-construction but before operations	Chevron, City of Richmond Planning Division, Fire Prevention Bureau, and Contra Costa Health Services	Review and verification prior to construction and again post-construction but before operations	Y	Chevron has completed this task. See Attachment 7: Reliability Program Report Section IV.C.
4.13-4b: Chevron will submit to CCHS a revised RMP and Safety Plan for the modified and new equipment at the Facility, and shall cause a revised RMP and Safety Plan to be submitted by the operator of the new hydrogen plant, in accordance with the requirements established in the applicable regulations. The revised RMPs and Safety Plans shall be submitted by the earlier of: 1) prior to operations; and 2) timing requirements under applicable	Chevron	The earlier of: 1) prior to operations; and 2) timing requirements under	City of Richmond Planning Division and Fire Prevention Bureau,	Review and verification prior to operations	Y	Chevron submitted to CCHS a revised RMP on July 26, 2018, and Safety Plan on July 24, 2018. CCHS verified implementation of this measure in August 2018. The content of these plans is established by the CalARP and RISO. **Chevron has implemented this mitigation measure, and this measure will not be addressed in future annual reports.**

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
regulations. The revised RMPs and Safety Plans shall reflect integration of ISSA, including consideration of damage mechanisms and evaluation of the consequences thereof resulting from the changes, as well as the LOPAs, conducted as a part of PHAs (initial and PHA updates/ revalidations), consistent with (proposed) amendments to the RISO. The RMPs must include all required components, including but not limited to a revised "off-site consequence" analysis of worst case anc alternate scenarios (EPA, 2009), a revised accident prevention and training program, pre-startup safety reviews and prescribe training and safety requirements for contractors conducting hot work and other designated types of activities. The RMPs must cover accident risks that have been identified in the Project-related PHAs, including inherently safer systems analyses conducted as a part of Project-related PHAs and management of change procedures. Chevron will report to the City acceptance of these plans by the CCHS prior to start-up of Modernization Project operations.		applicable regulations.	and, Contra Costa Health Services			
4.13-4c: Chevron will submit an amended hazardous materials business plan to CCHSHMP via the California Environmental Reporting System (CERS) consistent with the timing requirements of the applicable regulations. Chevron shall cause to be submitted by the operator of the hydrogen plant an amended hazardous materials business plan to CCHSHMP. The amendments will reflect the modified and new equipment at the Facility, including the hydrogen plant. Chevron will provide written confirmation to the City of CCHSHMP's acceptance of the amended plans.	Chevron	Consistent with timing requirements of the applicable CCHSHMP regulations	City of Richmond Fire Prevention Bureau Department CCHSHMP, and Contra Costa Health Services	Review and verification consistent with timing requirements of the applicable CCHSHMP regulations	Y	Chevron has amended its hazardous materials inventory to CCHSHMP via the CERS and submitted a hazardous materials business plan update by March 1, 2021. The hazardous materials inventory is updated on an ongoing basis as new hazardous materials are received onsite. CCHS verified implementation of this measure in August 2018.
4.13-4d: Chevron will revise the Facility's SPCC Plans and Facility ERPs consistent with the timing requirements of the applicable regulations, and shall cause the SPCC and ERPs for the hydrogen plant to be updated as well. Plan revisions must address the modified and new equipment at the Facility including the hydrogen plant. Chevron shall make the plans available for review upon request by CCHSHMP and EPA.	Chevron	Consistent with timing requirements of the applicable regulations	Applicable oversight agencies and City of Richmond Building Division; and Contra Costa	Review and verification consistent with timing requirements of the applicable regulations	Y	Chevron has completed a revision to its SPCC Plan prior to the regulatory deadline and will continue to revise the Plan in the future as required by EPA regulations. Also, the Facility Emergency Response Plans have been updated and will continue to be updated as required in the future. In addition, a pre-incident scenario addressing the new Hydrogen Plant emergency response needs has been prepared and reviewed in detail within the Refinery.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
			Health Services			CCHS verified implementation of the ERP in August 2018.
4.13-4e: For the additional catalyst identified in Table 4.13-4 (at hydrogen plant and FCC FHT), Chevron will either send spent catalyst for metal reclamation or dispose of the spent catalyst that cannot be reclaimed to a secure and licensed facility. Chevron will maintain records on the amount of catalyst sent for reclamation and for disposal and report to the City annually on these amounts.	Chevron	Annually post startup of operations	Chevron and City of Richmond Building Division	Review and verification annually post commencement of operations	Y	See Attachment 13 for 2022 Annual Spent Catalyst Report.
4.13-4f: Chevron shall ensure, through its contractual arrangements with Praxair, that Praxair will comply with all mitigation measures in this EIR as they pertain to the new hydrogen plant, and shall require Praxair to cooperate with Chevron as needed to ensure the mitigation measures with regard to the hydrogen plant are effectively implemented. Prior to construction of the new hydrogen plant, Chevron shall provide to the City and County documentation reflecting that these requirements are included in contractual agreements between Chevron and Praxair.	Chevron	Prior to construction of Project's new hydrogen plant	Chevron and City of Richmond Building Division	Review and verification consistent with timing requirements of this measure.	N/A	Chevron is now the owner and operator of the Hydrogen Plant. **No further updates will be provided concerning this mitigation measure.**
4.13-5a: Chevron is required to continue to implement the following mitigations from the Long Wharf EIR (Chambers Group, Inc., 2006, 2007): OS-3b, OS-3c; OS-4; OS-6b; and OS-7a,b.	*See Mitigation Measures OS-3b, OS-3c; OS-4; OS-6b; and OS-7a,b from the Long Wharf Final EIR below.*					
4.13-5b: Implement Mitigation Measure 4.13-4d.	*See Mitigation Measure 4.13-4d.*					
4.13-5c: All spills and releases of hazardous materials or hazardous waste to the environment, including those from the transportation of these materials, must be reported within 48 hours to the City, and to the other appropriate regulatory agencies in accordance with the timing and other notification and reporting requirements prescribed by the applicable laws and regulations. Prompt cleanup of all such spills is also required.	Chevron / Project Contractor	Within 48 hours after all spills and releases of hazardous materials or hazardous waste, and in accordance with applicable laws and regulations	Chevron, City of Richmond Building Division, and Fire Department and other appropriate regulatory agencies	Verification within 48 hours after all spills and releases of hazardous materials or hazardous waste, and in accordance with applicable laws and regulations	Y	Chevron makes notifications of potential releases to the City and to other agencies within the 48-hour timeframe in alignment with Chevron's internal procedures for release reporting and notification, which includes use of the County-owned Community Warning System (CWS). Subsequent cleanup is performed per applicable regulations and standards.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
4.13-6: Prior to commencing construction, Chevron shall: 6a: For all Modernization Project new and modified equipment, including but not limited to the hydrogen plant, Chevron shall obtain new or amended building permits from the City's Building Department pursuant to City Building Code and CBC requirements in effect at the time the permits are issued.	Chevron	Prior to construction	City of Richmond Planning and Building Services Department	Review and verification prior to issuing building permits	Y	See CUP A3 and A4 in Table A: Conditional Use Permit Conditions of Approval Compliance.
6b: For all Modernization Project new and modified equipment, including but not limited to the hydrogen plant, that are subject to City of Richmond Fire Department permit requirements, Chevron shall obtain new or amended fire permits from the City of Richmond Fire Department pursuant to City Fire Code and the CFC requirements in effect at the time the permits are issued.	Chevron	Prior to construction	City of Richmond Fire Department	Review and verification prior to issuing permits	Y	See MM 4.13-6a.
4.13-7a: Chevron shall implement the Modernization Project Reliability Program for all units and processes affected by the Modernization Project, including written reports specified in the Modernization Project Reliability Program. An initial Reliability Program report shall be submitted to the City and County prior to Project construction. Annual reports shall be submitted thereafter, including a report prior to commencement of Project operations. For the PHAs (initial and revalidations) specified in the Modernization Project Reliability Program, Chevron would complete the PHAs prior to commencement of Project construction, and again after construction but before startup of Project operations for any changes that may have arisen during construction that could affect the earlier PHAs. Chevron will thereafter update and revalidate PHAs in accordance with the RISO but not less than once every 5 years. As indicated in Mitigation Measure 4.13-4a, the PHAs shall include LOPAs, and written LOPA reports must be submitted to the County prior to construction for review, and Chevron shall submit a copy to the City simultaneously. To the extent that any post-construction PHA revalidations are warranted, Chevron shall submit LOPA reports for the post-construction PHA revalidations to the County for review prior to the startup of Project operations, and Chevron shall submit a copy to the City simultaneously.	Chevron	Prior to construction, again prior to operations, annually thereafter, and in accordance with the RISO but not less than once every 5 years thereafter	City of Richmond Planning & Building Services Department and Contra Costa County Health Services	Review and verification prior to construction, again prior to operations, annually thereafter, and in accordance with the RISO but not less than once every 5 years thereafter	Y	See MM 4.13-4a.
4.13-7b: Chevron shall complete an ISSA (as defined in the RISO), including review damage mechanisms and evaluation of their consequences, and LOPAs with written LOPA reports submitted by	Chevron	Prior to construction,	City of Richmond Building	Review prior to construction, again prior to	Y	See MM 4.13-4a.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
Chevron to the County for review, for new and modified Modernization Project components as part of the PHA revalidation process specified in the Modernization Project Reliability Program and Mitigation Measure 4.13-9a. Chevron will make the ISSA and PHAs available for review by the CCHS and the City, and will submit the LOPA reports to the County prior to construction for review.		again prior to operations	Division and Engineering Services Department and Contra Costa Health Services	operations, annually and every 5 years thereafter		
4.13-7c: Chevron will continue to review its procedures and programs for evaluating the hazards of planned changes at the Facility, and update them to incorporate damage mechanism review, including the identification of applicable damage mechanisms as well as the evaluation of the potential impacts of the damage mechanisms in light of the proposed changes, and layers of protection analysis consistent with the Reliability Program. Chevron's review and update of programs and procedures shall include, at a minimum, the Facility's management of change program/procedure and its PHA program/procedure. Chevron shall include, in its annual Modernization Project Reliability Program reports to the City, a description of the status of this documentation review and update process, as well as how the changes to these programs/procedures are being implemented at the Facility.	Chevron	Prior to operations	Chevron and City of Richmond Building Division and Engineering Services Department and Contra Costa Health Services	Prior to construction, again prior to operations, and annually thereafter	Y	Chevron currently has the following controls and processes that incorporate hazard evaluation of planned changes. · Manufacturing 520 (or MFG 520), Damage Mechanism Review Instruction, sets forth work processes to identify applicable damage mechanisms per equipment and piping class metallurgy. This standard incorporates industry practices and recommendations including API Recommended Practice 571, Damage Mechanisms Affecting Fixed Equipment in the Refinery Industry and API Recommended Practice 584, Integrity Operating Windows. · Refinery Instruction, RI-370, Management of Change (MOC) covers the processes used to evaluate planned changes and the revision incorporates damage mechanism reviews consistent with CalARP and CalOSHA requirements. Chevron has developed and implemented its Initial Risk Assessment (IRA) process which requires damage mechanism reviews for major changes. The IRA identifies if the MOC is a major change, the risks associated with the change and whether further study is needed (PHA), any mitigating measures that must be initiated, the necessary training/communication, and updates to affected Process Safety Information (PSI). Based upon the outcome of the assessment, additional evaluations and action items are assigned, and entered in to

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
						KMS to be tracked to completion. Prior to implementing a major change, the following actions are taken and documented in the MOC: 1. Perform an Inherently Safer Systems Analysis (ISSA) or Hierarchy of Hazard Control Analysis (HCA) per RI -398, Inherently Safer Systems 2. Review or conduct a Damage Mechanism Review (DMR) per MFG-520 3. PHA Facilitator review for possible What-if, HAZOP, etc. Refinery Instruction, RI-363, Process Hazard Analysis, reissued in December 2018, establishes the organized and systematic processes to evaluate potential hazards in the refinery. The revision to this RI will incorporate Chevron's current practices which include damage mechanism reviews for applicable process units as well as following new regulations and industry best practices.
4.13-7d: Chevron will fund the costs of qualified third-party experts to assist CCHS and the City in the review of PHAs, ISSAs, and LOPAs completed for the Modernization Project pre- and post-construction, and will cooperate in providing access to Chevron documentation and facilities, as needed, for the third-party expert, CCHS, and the City to complete these reviews. At such time as the RISO is amended, and to the extent this amendment requires Chevron to fund a new, full-time chemical process safety inspector to do inspections at the Facility, Chevron shall provide to CCHS and/or the City the level of funding required to hire a new, full-time chemical process safety inspector for the Facility, and thereafter shall no longer be required to fund a separate third-party expert for post-construction reviews of PHAs, ISSAs, and LOPAs or other inspections.	Chevron / Project Contractor	Ongoing, as costs are incurred	City of Richmond Building Division and Engineering Services Department and Contra Costa Health Services	Review prior to construction and post-construction	Y	Chevron pays invoices from City of Richmond as they are received.
4.13-7e: Chevron shall provide funding in a reasonable amount sufficient for the City to complete an air deposition background study of air quality at up to 20 locations in Richmond. The study may be done in conjunction with local high school science departments or otherwise, and may include quarterly sampling,	Chevron	Ongoing, as costs are incurred	City of Richmond Building Division and	Verification of funding obligation prior to commencement of operations; verification of reimbursement obligations	Y	Chevron has engaged the City concerning implementation of this measure and is prepared to provide funding for the City to complete the air deposition background study. Reference

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
using surface sampling collection pads, and certified laboratory analysis of such pads at locations to be determined. Study results shall be compiled annually, and made publicly available. Chevron will fund this program for a 5-year period following commencement of Modernization Project operations. In the event of a future accidental fire or other significant accidental release of air pollutants from the Facility, Chevron shall reimburse the City for the cost of engaging a qualified consultant to perform additional air deposition sampling and analysis to evaluate the magnitude and significance of the release. The results of the post-accident deposition sampling will be publicly available.			Engineering Services Department	continuous thereafter, as necessary.		Transmittal #30 MM 4.13-7e Funding of Air Deposition Study.pdf.
4.13-7f: Given the Modernization Project would include new equipment and operational practices at the Facility, Chevron will provide further training for and coordinate with the Richmond Fire Department prior to Modernization Project operations. Training would continue annually during Project operations.	Chevron	Prior to operation and annually thereafter	City of Richmond Fire Department	Verification prior to operation and annually thereafter	Y	Chevron has developed a "Phased Training Plan for the Richmond and El Cerrito Fire Departments" in response to this measure. Modernization Project specific training has been completed in three phases: Phase I, which included an introduction and history as well as all process facilities including the Modernization Project; Phase II, which included review of Chevron Fire Department's organization and equipment as well as a pre-incident scenario introduction at the LPG loading racks and ammonia bullets; and Phase III, which included on-site, hands-on fire training and Modernization Project process hazards. Fire training is scheduled to continue at least annually during Project operation. Due to COVID 19 protocols extending into 2021, training was not conducted in 2021. Training was not conducted in 2022 due to Refinery labor action and City staffing issues. The training is anticipated to resume in 2023.
4.13-7g: Chevron shall work with the Contra Costa Sheriff's Department, the City, and other interested stakeholders, prior to the commencement of Project operations, to evaluate the existing CWS and to determine whether additional services would be beneficial, including but not limited to mechanisms for the provision of emergency messages and communications, translated into multiple different languages (considering possible integration with existing cell phone registration, email, and social media	Chevron	Prior to operation	Contra Costa County Sheriff's Department and City of Richmond Public	Verification prior to operation	Y	Chevron has engaged with the Contra Costa Sheriff's Department, the City, and other interested stakeholders and was actively involved with the design and rollout of the new CWS, which went live in 2017. Chevron continues to work with various stakeholders to ensure that the new CWS continues to address this measure. **No further updates will be provided concerning this measure.**

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
notification databases and systems), and the provision of emergency notifications to locations in the community where large numbers of people may congregate at any given time (such as shopping centers, transit centers such as Bay Area Regional Transit stations, Amtrak stations, and bus stations). Chevron shall contribute toward, and help identify additional funding for, such additional services.			Safety Department			
4.13-7h: Chevron will fund the costs of a third-party expert to assist the County and the City with the review of the Reliability Program reports and other submittals required by the Reliability Program and related mitigation measures, as needed. The third-party expert will be selected and retained by the County or the City within the County's or City's discretion. This funding obligation survives any amendment of the RISO that may require funding of an inspector for the Facility.	Chevron	Upon start of operations and continuous thereafter	City of Richmond Building Division and Engineering Services; and CCHS	Review and verification upon commencement of operations and continuous thereafter.	Y	Chevron continues to work with Contra Costa Health Services pursuant to the terms of the RISO, and will contribute funds when requested per this requirement.
4.13-7i: Chevron shall adhere to the total acid number (TAN) limits of 0.3 mg milligrams potassium hydroxide per gram (KOH/g) for crude, 1.5 mg KOH/g for sidecuts produced from the crude unit, and 1.0 for gas oils and blends processed through the fluid catalytic cracker, fluid catalytic cracker feed hydrotreater, hydrotreater, heavy neutral hydrocracker, and light neutral hydrocracker. If Chevron intends to process a feedstock for a short-term basis (i.e., up to 6 months) that exceeds these TAN limits, it must complete its Management of Change (MOC) process for the proposed deviation, and shall take into account any existing damage mechanism reviews as specified in Mitigation Measure 4.13-7c that have been prepared for the identified units and piping circuits. If Chevron intends to process a feedstock for a longer-term basis (i.e., more than 6 months) that exceeds these TAN limits, it must complete its MOC process for the proposed deviation and this MOC must include a damage mechanism review as specified in Mitigation Measure 4.13-7c. The MOC evaluation, for short or longer duration TAN deviations, shall include an evaluation of the potential hazards that could result from the TAN deviation in all affected units and piping circuits, including naphthenic acid corrosion impacts. Chevron shall designate a Facility Area Business Unit Manager with final decision-making authority to approve any TAN deviation from the TAN limits.	Chevron	Upon start of operations and continuous thereafter.	City of Richmond Building Division and Engineering Services; and Contra Costa Health Services	Review and verification upon commencement of operations and continuous thereafter.	Y	Chevron currently has the following controls and processes in place to meet its ongoing obligation for TAN. · The Crude Acceptance Tool is utilized to determine resulting crude blends and product quality for evaluating any new crude for potential purchase. The tool includes flags for crude blends and resulting sidecuts and FCC/hydrocracker feeds at TAN limits specified by this condition. · Refinery Instruction 370, Management of Change is required for all new crude evaluations. If flags are triggered as a result of the Crude Acceptance Tool, reviews are assigned within the MOC in the KMS software. These MOCs will include approval by the appropriate Area Business Unit Manager or their delegate. · Crude Monitoring Program outlines the roles and responsibilities for TAN monitoring and reporting. If the MOC is approved, the following actions items are assigned: o An MOC action item specifies that the Materials Engineer complete "Mercaptan TAN MOC Addendum". The Materials Engineer completes a

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
Chevron shall provide the results of any TAN deviation MOC evaluation to the City and County before processing the feedstock that deviates from the established TAN limits. Chevron shall include in its annual Reliability Program reports: (a) details regarding the results of its MOC for any TAN deviations; (b) average annual TAN for crudes and gas oils/blends processed at the Facility for each calendar year starting with 2008; and (c) for any feedstock runs with TAN levels higher than established TAN limits, include the actual TAN levels of the deviating feeds and the duration of the deviating feedstock runs.						corrosion review or reliability review, as appropriate, based on the planned crude processing duration. The review is recorded in a report titled "MOC for Crude Review [Required for RMP Compliance Plan]". Records will be permanently attached to the MOC in the KMS software. o The Compliance Specialist (or PSM Specialist) submits a TAN deviation MOC evaluation including corrosion review or reliability analysis, as appropriate, to the City prior to processing the crude or feedstock. o The Modernization Project Compliance Specialist Compliance submits the Annual Reliability Program report which includes TAN reporting obligations. Since start of Project operations, there have been no TAN deviations. See Attachment 7 Reliability Program Report, Attachment RP2 Exhibit B for 2022 average annual TAN for crudes and gas oils/blends processed at the facility. Previous year's data was submitted with the 2022 Reliability Program Report as Attachment RP2 Exhibit B.
4.13-7j: Chevron shall include in its annual Reliability Program reports the annual average sulfur content of feedstocks, including separate annual averages for crude oils/blends and gas oils/blends, processed at the Facility for each year since and including 2008.	Chevron	Upon start of operations and continuous thereafter	City of Richmond Building Division and Engineering Services; and CCHS	Verification due annually	Y	See Attachment 7 Reliability Program Report, Attachment RP2 Exhibit C for 2022 annual average sulfur content of crude oils/blends and gas oils/blends processed as the Facility. Data from 2008 to 2010 was previously provided as part of the Environmental Impact Review for the "Baseline Period". Previous year's data was submitted with the 2022 Reliability Program Report as Attachment RP2 Exhibit C.
4.13-8: Implement Mitigation Measures 4.13-4a, b, c, d, f; 4.13-5a, b, c; 4.13-6a, b; 4.13-7a, b, c, d, e, f, g, h, i, j; 4.13-11a, b, c.	*See referenced mitigation measures*					
4.13-9a: Chevron will coordinate with the Contra Costa County Sheriff's Department, as owner and operator of the CWS, and other stakeholders, to work with local area schools (Washington Elementary School, Lincoln Elementary School, Peres Elementary	Chevron	Prior to operation	Chevron and Contra Costa County	Verification prior to operation	Y	Chevron coordinated with the Contra Costa County Sheriff's Department and the CAER organization to address this MM. Chevron met with the Sheriff's Department and CAER and contacted the four

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
School, Verde Elementary School) to ensure that their emergency response procedures and plans are adequate to minimize the risk to students in the event of a refinery incident. This shall include, as necessary, updating plans and procedures, providing emergency response equipment, and providing training to school staff. Chevron will coordinate with the Sheriff's Department and local area schools to ensure that the schools have operational National Oceanic and Atmospheric Administration weather radios and receive training on how to use them. Coordination will be completed prior to start of Modernization Project operations.			Sheriff's Department			schools (Washington Elementary School, Lincoln Elementary School, Peres Elementary School, Verde Elementary School) to determine what their needs might be and offer assistance to ensure their emergency response procedures and plans are adequate to minimize the risk to students in the event of a Refinery incident. All four schools participated in the All Schools Drill in Fall 2018. Chevron will assist the schools in obtaining up to $2,500 each from CAER, and supplying new NOAA/weather radios. **No further updates will be provided concerning this measure.**
4.13-9b: Implement Mitigation Measures 4.13-4a, b, c, d; 4.13-6a, b; 4.13-7a, b, c, d, e, f, g; 4.13-11a, b, c.		*See referenced mitigation measures*				
4.13-10a: If contamination is discovered during Modernization Project construction, the Facility will report the discovery to the City, the RWQCB, and any agency required to receive such notice under applicable law, and shall promptly manage, contain, treat, transport, and/or arrange for off-site disposal of such contaminated material as required by applicable law and existing RWQCB Order. Chevron shall also train construction workers to recognize contamination, and shall use authorized remediation contactors with trained workers to characterize and manage any contaminated media discovered during Modernization Project construction.	Chevron	During construction	Chevron, City of Richmond Building Division and Engineering Services Department and RWQCB	Review and verification during construction, in the event of contamination	Y	No contamination has been discovered during Modernization Project construction and Chevron has implemented training obligations. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
4.13-10b: If Modernization Project construction occurs in areas subject to RWQCB Order R2-2011-0036, Chevron will first receive approval of the construction activities from the RWQCB, as required under the order, and report the approval conditions to the City. Chevron will comply with applicable regulatory requirements and RWQCB approval conditions in managing the Modernization Project construction activities.	Chevron	Prior to construction in areas subject to RWQCB Order R2-2011-0036	Chevron, City of Richmond Building Division and Engineering Services Department, and RWQCB	Review and verification during construction, in the event of contamination	N/A	No Project construction has occurred in areas subject to RWQCB Order R2-2011-0036.
4.13-11a: Update the Facility's emergency plan to assure that the Modernization Project would not impair implementation of the	Chevron	Prior to operation	City of Richmond	Review and verification prior to operation	Y	Chevron has completed an update to the Facility's Emergency Response Plan to reflect any

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
plan, and to assure that the plan is effective. Develop Emergency Operating Procedures for new and modified Modernization Project equipment. Revisions to the plan and procedures would include clear instructions to ensure all non-essential personnel stay outside of hazardous areas during an emergency. Incorporate revisions into a revised Safety Plan submitted to CCHS for approval and acceptance prior to commencement of Modernization Project operation, and report submission date and CCHS approval to the City.			Public Safety Department and Contra Costa Health Services			modifications made to the Facility as part of the Modernization Project. As part of the pre-operations review CCHS verified implementation of this measure in August 2018. **Chevron has implemented this mitigation measure, and this measure will not be addressed in future annual reports.**
4.13-11b: Ensure Facility personnel and contractors are trained on the revised emergency procedures, including to ensure all non-essential personnel stay outside of hazardous areas during an emergency. Maintain records on initial training and annual refreshers that can be provided to the City or County upon request.	Chevron	Prior to operation and annually thereafter	Chevron, City of Richmond Public Safety Department and Contra Costa Health Services	Review and verification prior to operation	Y	All facility personnel have been trained in the updated Emergency Response Procedures as part of their plant specific training prior to commencement of Project operations. Records of this training are maintained by the Refinery for all employees and contractors.
4.13-11c: Chevron shall coordinate with the City, County, and other local and regional agencies, including BAAQMD and fire departments in neighboring communities, to plan and conduct periodic emergency response drills, to establish joint operations centers and joint information centers, and to establish communications networks and protocols for emergency response communications extending to these neighboring communities and agencies to further develop the infrastructure and readiness for mutual aid as between these various agencies and fire departments, in the event of emergency response incidents.	City of Richmond Public Safety Department, Contra Costa Health Services, and Chevron	Prior to operation and annually thereafter	Chevron, City of Richmond Public Safety Department and Contra Costa Health Services	Coordination, review, and verification prior to operation	Y	CCHS verified implementation of this measure in August 2018. Chevron, through its Fire Department, continues to work with the identified agencies to implement and improve emergency response related drills, communications, and readiness, as needed.
4.13-12: Chevron will update its fire protection plan to address vegetated open space areas adjacent to process areas, and to assure that Chevron Fire Department personnel are trained and equipped to serve as first responders to a fire in these vegetated areas. The plan will be provided to and accepted by the Richmond Fire Department prior to start of Modernization Project operations. The plan must include: 12a: Fuel management, including seasonal mowing, removal of brush, trimming of trees, or other measures to reduce fuel loads	Chevron	Prior to operation	City of Richmond Fire Department	Review and verification prior to operation	Y	Chevron updated the Facility Fire Protection Plan, which includes provisions for fuel management (including seasonal mowing, removal of brush, trimming of trees, or other measures to reduce fuel loads during the dry season), construction and maintenance of fire breaks and fire roads in vegetated open space areas to provide immediate access for emergency responders, and emergency response coordination. The updated Facility Fire

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
during the dry season (i.e., from April 1 through November 30, unless extended by the Richmond Fire Department) in areas within 100 feet of process areas. 12b: Construction and seasonal maintenance of appropriate fire breaks (e.g., maintenance of unvegetated areas) to minimize size of fire in vegetated open space areas, provided no new vegetative clearing shall be completed until surveys have been completed for protected plants and animals, and the absence of such resources has been confirmed. 12c: Maintenance of fire roads in vegetated open space areas to provide immediate access to emergency responders, including removal of potential obstacles and brush and leveling of dirt roads on steep hillsides following the end of each rainy season (approximately April or May). 12d: Emergency response coordination, including enhanced mutual aid, protocols to assure adequate firefighter responses to vegetated open space area fires as well as Facility area.						Protection Plan was approved by the City of Richmond Fire Marshall. **Chevron has implemented this mitigation measure, and this measure will not be addressed in future annual reports.**
4.13-13a: Prior to restarting construction of the Modernization Project, and again prior to commencement of Project operations, Chevron shall submit to the City a report describing the status of its compliance with all corrective action measures (including, but not limited to, compliance with probationary terms) imposed or agreed to as a result of the agency proceedings relating to the August 6, 2012 fire. As part of this report, Chevron shall describe its ongoing consultations with the agencies that investigated the August 6, 2012 fire, including Cal/OSHA, the CSB, and Contra Costa County, including any feedback or direction that has been provided by those agencies concerning implementation of the corrective action and agency recommendations and Chevron's response thereto.	Chevron	Prior to construction and again prior to operation	City of Richmond Building Division and Engineering Services Department	Review prior to construction and again prior to operation	Y	On August 13, 2018, Chevron submitted a report to comply with the pre-operations requirements of 4.13-13a. These included updates on Chevron's consultations with the agencies that investigated the August 6, 2012 fire, including Cal/OSHA, the CSB, and Contra Costa County. **Chevron has implemented this mitigation measure, and this measure will not be addressed in future annual reports.**
4.13-13b: Chevron will fund the costs of a qualified expert in refinery safety, to be selected and retained by the County and/or the City within the County's and/or City's discretion, to review the ISSAs, PHAs, LOPAs, and other safety documentation associated with events triggering such ISSAs, PHAs, or LOPAs. Chevron will also cooperate in providing access to Chevron documentation and facilities, as needed, for the expert, the County, and the City review. At such time as the RISO is amended, and to the extent this	Chevron	Prior to construction and continuous thereafter	City of Richmond Building Division and Engineering Services Department	Review prior to construction and continuous thereafter.	Y	As anticipated by the mitigation measure, the RISO has been amended and requires Chevron to fund a position within CCHS. Chevron is in compliance with this requirement and provides the necessary funding through the RISO funding mechanism.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
amendment requires Chevron to fund a new, full-time chemical process safety inspector to do inspections at the Facility, Chevron shall provide to CCHS and the City the level of funding required to hire a new, full-time chemical process safety inspector for the Facility, and thereafter shall no longer be required to fund a separate third-party expert for reviews of PHAs, ISSAs, LOPAs, or other inspections.			and Contra Costa Health Services			
4.13-13c: Chevron will complete the tri-annual safety audits required by RISO. In addition, upon request by the County and/or City, Chevron shall fund the costs of a qualified third-party expert in refinery safety to perform a safety or compliance audit that would be provided to the County and/or City for review.	Chevron	Ongoing	City of Richmond Building Division, Engineering Services, and CCHS	Review and verification every 3 years	Y	Chevron completed the required tri-annual safety audit in 2022 in conjunction with CCHS. See Attachment RP6: Reliability Program Report IV.F.2 of Attachment 7: Annual Reliability Program Report. Chevron will continue to complete the tri-annual safety audits as required and fund costs of a qualified third-party expert to perform audits at the request of the City or County. CCHS verified implementation of this measure in August 2018.
4.13-13d: Chevron will report to the City quarterly, and shall provide a copy of this report to the County, after Project approval on the status of the corrective actions taken to implement agency recommendations to Chevron resulting from the August 6, 2012 fire, as well as any corrective actions taken by Chevron as a result of its own investigation. To the extent that Chevron elects not to implement a recommendation made by an agency, Chevron shall include in these quarterly reports a detailed explanation of its rationale for doing so.	Chevron	Quarterly after Project approval	City of Richmond Building Division and Engineering Services Department	Review quarterly after project approval	Y	Chevron has submitted quarterly 4.13-13d reports since the Project was approved. In 1Q21, the U.S. Chemical Safety Board's closed the final recommendation arising from the 2012 Chevron Richmond Fire. As such, all corrective actions taken to implement agency recommendations and as a result of Chevron's internal investigation have been implemented and, where required, integrated into Chevron's maintenance and operating procedures. The corrective actions are therefore closed. The Refinery submitted its twenty-fourth and final Quarterly Crude Fire Corrective Action Status Report (MM 4.13-13d) under the quarterly reporting requirement on March 31, 2021. There will be no further updates pursuant to Mitigation Measure 4.13-13d.
4.13-13e: Chevron shall fund the City's coordination with the CSB, Cal/OSHA, the BAAQMD, and the EPA on their investigations regarding the Facility to the extent these agencies request City involvement or consultation.	Chevron	Upon agency request to City	City of Richmond Building Division and	Coordination upon agency request to City	N/A	Chevron has not been presented any invoices for costs related to this measure but is prepared to pay such invoices in a timely manner when they are received.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
			Engineering Services			
4.13-13f: Chevron shall designate a Facility Area Business Unit Manager as the management level position bearing responsibility for any and all decisions to not implement a recommendation made during an inspection or turnaround. Chevron shall also designate a Facility Area Business Unit Manager as the management level position bearing responsibility for the establishment of the parameters in the Integrity Operating Window program, as well as for any decisions to override, bypass, or otherwise disregard an alert or flag that arises through the Integrity Operating Window program. The annual Reliability Program reports shall include clear identification of the individuals acting as Area Business Unit Managers to whom these accountabilities have been assigned. If the management position bearing any of these responsibilities changes within Chevron from the Area Business Unit Manager to another management-level job title, Chevron shall notify the City and include an update to this effect in its Reliability Program annual report.	Chevron	Prior to start of operations and as required by this measure.	City of Richmond Building Division and Engineering Services Department and Contra Costa Health Services	Review and verification prior to commencement of operations and at least annually thereafter	Y	Chevron currently has the following controls and processes that designate the Facility Area Business Unit Manager (ABUM), now titled Refinery Business Manager (RBM), as the management level position bearing responsibility for decisions regarding recommendations made during aninspection or turnaround. · Manufacturing 530 (or MFG 530), Fixed Equipment Integrity Threat Recommendation and Resolution, establishes a process for identifying integrity threats and issuing recommendations, and developing associated resolution plans designed to prevent and mitigate loss of containment due to fixed equipment degradation. MFG 530 specifies that “Operations Management”, which for the purposes of the Richmond Refinery is the RBM, has the role and responsibility to provide final approval on all business unit integrity threat resolution and mitigation plans and is accountable for ensuring resolution and mitigation activities are completed by due dates. · Further the Richmond Refinery Fixed Equipment Integrity Threat Recommendation Standard specifies that the RBM provides the final approval on all Business Unit Integrity Threat resolution and mitigation plans and is accountable for ensuring resolution and mitigation activities are completed by due dates. Chevron has the following controls and processes that address the Integrity Operating Windows (IOW) program and management. · Manufacturing 526 (or MFG 526), Integrity Operating Windows Standard, released in March 2019, establishes a process for the development and management of Integrity Operating Windows. The standard designates the RBM as the

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
						responsible position to approve any additions, changes, or deletions to the IOW program as well as how bypasses of IOWs are managed. Note, the RBM may also designate the Refinery Shift Leader (RSL) to approve how bypasses of IOWs are managed. The RBM may also rely on the Operating Assistant to manage the change management process for IOW-related changes. · Refinery Instruction, RI-372, Bypassing Critical Protections establishes the protocol which includes process control alarms including Safe Operating Limits (SOL) established by the IOW program. The instruction designates the RBM as the responsible person to approve implementation of the bypass. · As part of the monthly Unit Reliability Brief (URB) meetings, attended by the RBM and subject matter experts in the areas of reliability and operations, reliability topics, such as IOW alerts, are reviewed relative to current operation.
4.13-13g: Prior to the issuance of building and fire permits for the Project, Chevron shall provide to the City documentation demonstrating that it has completed implementation of (to Cal/OSHA's satisfaction) or otherwise discharged (through administrative appeal) all corrective or abatement actions resulting from Cal/OSHAs investigation following the August 2012 fire, and from Cal/OSHAs temporary leak seal investigation.	Chevron	Prior to issuance of building and fire permits	City of Richmond Building Division and Engineering Services Department	Review and verification prior to issuance of building and fire permits.	Y	In an Aug. 22, 2016 email from Clyde Trombettas of Cal-OSHA to Lina Velasco of the City of Richmond, Mr. Trombettas confirmed that "… Chevron has abated both sets of citations, addressed Cal/OSHA's concerns regarding any related hazards, and that I am satisfied with the proof of abatement". **Chevron has implemented this mitigation measure, and this measure will not be addressed in future annual reports.**
4.13-13h: Chevron shall establish Integrity Operating Windows (IOWs) to monitor process temperatures, for purposes of identifying process temperature increases above the baseline period (2008-2010) for any individual circuit affected by the Modernization Project (as indicated in the Reliability Analysis Appendix 4.13-REL). The IOW shall establish temperature "flags" for each temperature monitoring location based on industry-standard damage curves. Prior to implementation of the IOW temperature flags, Chevron shall provide information to the City and County regarding flag trigger temperature levels and the basis for them,	Chevron	Upon start of Project operations and continuously thereafter	City of Richmond Planning & Building Services Department City of Richmond Building Division	Annually and as reports are submitted	Y	Chevron has established Integrity Operating Windows (IOWs) which monitor process temperatures for the applicable damage mechanisms identified in the Reliability Analysis Appendix 4.13-REL which include sulfidation, high temperature sulfidation, and high temperature hydrogen attack for the applicable process units impacted by the Modernization Project. CCHS reviewed IOW tables establishing these temperature flags in May 2018.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
and provide the City and County an opportunity to review and comment on them before they are implemented. The IOW-2 temperature flag shall be triggered if the process temperature exceeds the established temperature for a cumulative 365 days, and shall require Chevron to perform a reliability analysis to evaluate, among other things, existing process conditions, flag dates for wall thickness, monitoring and inspection data, expected corrosion rates, metallurgy, existing damage mechanism reviews, and monitoring and inspection frequency. Chevron shall report the results of these reliability analyses in its annual Reliability Program report, and shall make process temperature data for all temperature monitoring locations within each process unit and circuit includes in the Reliability Analysis (Appendix 4.13-REL) available for review by the City or County at the refinery. Chevron also shall include in its annual Reliability Program reports a listing of all events relating to process temperatures reaching levels that triggered an IOW-level 2 (defined by Chevron as a "slower acting event that requires a technical evaluation and recommendations within one week") alert during the calendar year that is subject of the annual report, as well as a description of the resolution of each such event. Chevron shall report to the City and County within one week of any IOW-level 1 (defined by Chevron as a "fast acting event that requires operator action within a shift or two") alert event relating to IOW process temperature parameters for circuits affected by the Modernization Project (as indicated by the Reliability Analysis Appendix 4.13-REL).			and Engineering Services; Contra Costa Health Services			Since project operations began on April 17, 2019, IOW-level 1 alert events are reported to the City within one week, while IOW-level 2 alert events are tracked internally and listed in Exhibit A. No IOW-level 2 alert events have triggered the reliability analysis requirement (cumulative 365 days of exceeding established temperature flag).
Note: See Table 5-3 for the Mitigation Measures from the Long Wharf Final EIR that are applicable to the Modernization Project.						
4.14 PUBLIC SERVICES						
Construction or operation of the Project would result in no-significant impacts related to public services. No mitigation is required; however some improvement measures are recommended (see Table 5-2).						
4.15 PARKS AND RECREATION						
Construction or operation of the Project would result in no-significant impacts related to parks and recreation. No mitigation is required or recommended.						

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
4.16 TRANSPORTATION						
4.16-1: Chevron shall work with the director of the City of Richmond Public Works Department (or the director's designated representative) and Caltrans to provide modified traffic control implemented at the intersection of Castro Street/I-580 Westbound Ramps during peak arrival and departure times in the PM peak hour. The modified traffic control shall be accomplished by one or more of the following methods: (1) posting a technician at the intersection to manually operate signal controls (using the police key feature of standard traffic signal controllers); (2) programming an alternate signal timing plan that would be in operation during specified peak commute periods; and/or (3) posting traffic control officers at the intersection to manually control traffic movements. Chevron shall pay the full cost of this measure, including costs of Richmond police officers or other law enforcement personnel to provide the traffic control under above-cited methods (1) or (3).	Chevron / Project Contractor	During construction in PM peak period	City of Richmond Public Works Department along with Caltrans	Coordination and verification, continuous during construction	Y	Chevron, in conjunction with the City of Richmond Public Works Department, completed a comprehensive review of the primary intersections impacted by the Project. Chevron continues to work with the City to provide modified traffic control at the intersection of Castro Street/I-580 Westbound Ramps as necessary during peak arrival and departure time in the PM peak hour. The modified traffic control has been accomplished by one or more of the specified methods, and Chevron has paid, and continues to pay, the cost of any signal timing changes or other traffic control measures. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
4.16-2: The following measures shall be implemented at the intersection of Richmond Parkway/Gertrude Avenue: 2a: Chevron shall work with the director of the City of Richmond Public Works Department (or the director's designated representative) to provide modified traffic control during peak arrival and departure times in the PM peak hour. The modified traffic control shall be accomplished by one or more of the following methods: (1) posting a technician at the intersection to manually operate signal controls (using the police key feature of standard traffic signal controllers); (2) programming an alternate signal timing plan that would be in operation during specified peak commute periods; and/or (3) posting traffic control officers at the intersection to manually control traffic movements. Chevron shall pay the full cost of this measure, including costs for sheriff's deputies or other law enforcement personnel to provide the traffic control under above-cited methods (1) or (3). 2b: During the peak congestion periods, through the use of traffic cones (and flaggers as needed), Chevron shall reconfigure the southbound (Richmond Parkway) approach to the intersection to provide one shared left-through lane, one through lane, and one shared right-through lane.	Chevron / Project Contractor	During construction in PM peak period	City of Richmond Public Works Department along with Caltrans	Coordination and verification, continuous during construction	Y	Chevron continues to work with the City of Richmond Public Works, Police, and Engineering Departments to provide modified traffic control at the intersection of Richmond Parkway/Gertrude Avenue as necessary during peak arrival and departure times in the PM peak hour. The modified traffic control has been accomplished by one or more of the specified methods, and Chevron has paid, and continues to pay, the cost of any signal timing changes or other traffic control measures. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3. Regarding MM 4.16-2b, after initial discussions with the City of Richmond Public Works, Police and Engineering, and Planning Departments, it was determined that this measure was not necessary and that all traffic control could be successfully

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
						achieved through modifications to intersection signal timings.
4.16-3: Mitigation Measure 4.16-1 shall be implemented.			*See Mitigation Measure 4.16-1.*			
4.16-4: The following measure shall be implemented at the intersection of Castro Street/Hensley Street: Chevron shall work with the director of the City of Richmond Public Works Department (or the director's designated representative) to provide modified traffic control during peak arrival and departure times in the PM peak hour. The modified traffic control shall be accomplished by one or more of the following methods: (1) posting a technician at the intersection to manually operate signal controls (using the police key feature of standard traffic signal controllers); (2) programming an alternate signal timing plan that would be in operation during specified peak commute periods; and/or (3) posting traffic control officers at the intersection to manually control traffic movements. Chevron shall pay the full cost of this measure, including costs of law enforcement personnel to provide the traffic control under above-cited methods (1) or (3).	Chevron / Project Contractor	During construction in PM peak period	City of Richmond Public Works Department	Coordination and verification, continuous during construction	Y	Chevron corresponds with and meets with the City of Richmond Public Works, Police and Engineering Departments to provide modified traffic control at the intersection of Castro Street/Hensley Street as necessary during peak arrival and departure times in the PM peak hour. The modified traffic control has been accomplished by one or more of the specified methods. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
4.16-5: Mitigation Measure 4.16-2 shall be implemented.			*See Mitigation Measure 4.16-2.*			
4.16-6: Mitigation Measure 4.16-1 shall be implemented.			*See Mitigation Measure 4.16-1.*			
4.16-7: The following measures shall be implemented, in consultation with the Public Works Director or his designee, at the intersection of Castro Street/General Chemical Access: 7a: During the AM peak period, through the use of traffic cones (and flaggers as needed), Chevron shall reconfigure the northbound (Castro Street) approach to the intersection to provide two left-turn lanes and one shared right-through lane. The inbound approach on General Chemical Access shall also be reconfigured to provide two receiving lanes.	Chevron / Project Contractor	During construction in AM peak period	City of Richmond Public Works Department	Verification, continuous during construction	Y	After initial discussions with the City of Richmond Public Works, Police and Engineering Departments, it was determined that this measure was not necessary.
7b: During the PM peak period, through the use of traffic cones (and flaggers as needed), Chevron shall reconfigure the eastbound (General Chemical Access) approach to the intersection to provide two exclusive right-turn lanes and one exclusive left-turn lane.	Chevron / Project Contractor	During construction in PM peak period	City of Richmond Public Works Department	Verification, continuous during construction	Y	See MM 4.16-7a.

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
7c: Chevron shall work with the director of the City of Richmond Public Works Department (or the director's designated representative) to provide modified traffic control during peak arrival and departure times in the AM and PM peak hours. The modified traffic control shall be accomplished by one or more of the following methods: (1) posting a technician at the intersection to manually operate signal controls (using the police key feature of standard traffic signal controllers); (2) programming an alternate signal timing plan that would be in operation during specified peak commute periods; and/or (3) posting traffic control officers at the intersection to manually control traffic movements. Chevron shall pay the full cost of this measure, including costs of law enforcement personnel to provide the traffic control under above-cited methods (1) or (3).	Chevron / Project Contractor	During construction in AM and PM peak periods	City of Richmond Public Works Department	Coordination and verification, continuous during construction	Y	Chevron corresponds with and meets with the City of Richmond Public Works, Police and Engineering Departments to provide modified traffic control at the intersection of Castro Street/General Chemical as necessary during peak arrival and departure times in the PM peak hour. The modified traffic control has been accomplished by one or more of the specified methods. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
4.16-8: Mitigation Measure 4.16-4 shall be implemented.	*See Mitigation Measure 4.16-4.*					
4.16-9: Mitigation Measure 4.16-2 shall be implemented.	*See Mitigation Measure 4.16-2.*					
4.16-10: Chevron shall repair any roads damaged as a result of Modernization Project construction activity to a structural condition equal to that which existed prior to construction activity. Prior to Project construction, City of Richmond Public Works Department or the Director's designated representative would document road conditions for all routes that would be used by Project construction-related vehicles. The City would also document road conditions after Project construction is completed. The pre- and post-construction conditions of the haul routes shall be reviewed, and Chevron or contractor(s), and staff of the Public Works Department, would enter into an agreement prior to construction that details the pre-construction conditions and the post-construction requirements of a rehabilitation program.	Chevron / Project Contractor	Prior to and after construction	City of Richmond Public Works Department	Document road conditions prior to construction and after construction, verification of any needed repairs	Y	Prior to commencement of construction, Chevron funded a City-prepared baseline report of road conditions. This document is in the City's files. Chevron and the City entered into a Memorandum of Understanding specifying that Chevron will repair roads damaged as a result of Modernization Project construction activity to a structural condition equal to that identified in the baseline report.
4.16-11: These intersections are maintained by the County, and thus the City has no independent jurisdiction to enforce any requirement to mitigate impacts at these intersections. However the City and Chevron shall coordinate with the Contra Costa County Department of Public Works to implement the following mitigation measure at the intersections of Richmond Parkway and Pittsburg Avenue and Richmond Parkway and Parr Boulevard:	Chevron and City of Richmond Public Works Department	During construction	City of Richmond Public Works Department	Coordination and verification, continuous during construction	Y	Chevron hired the consulting firm AECOM to collect the required traffic data at the Richmond Parkway/Pittsburg Avenue and Richmond Parkway/Parr Boulevard intersections in agreement with the City after worker counts had ramped up following the start of construction during the AM and PM peak commute periods. Since the traffic data indicated that both intersections operate

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
11a: Collect traffic data at the Richmond Parkway/Pittsburg Avenue and Richmond Parkway/Parr Boulevard intersections two weeks after start of construction during the AM and PM peak commute periods (6:00 to 9:00 a.m. and 4:00 to 6:00 p.m.). If traffic data indicate that either or both intersections operate below the established standard (i.e., LOS E or LOS F), Chevron shall work with the director of the City of Richmond Public Works Department (or the director's designated representative) in coordination with the Contra Costa County Public Works Department to implement one or more of the of the following during the construction period: 1. Provide modified traffic control during the peak AM and/or PM peak commute periods. The modified traffic control shall be accomplished by one or more of the following methods: a. Posting a technician at the intersection to manually operate signal controls (using the police key feature of standard traffic signal controllers) b. Programming an alternate signal timing plan that would be in operation during the peak commute periods c. Posting traffic control officers to manually control traffic movements during peak commute periods 2. Using cones and/or flaggers, temporarily reconfigure the lane assignments at the intersection during peak AM and/or PM peak commute periods Chevron shall pay the full cost of this measure, including costs of law enforcement personnel to provide the traffic control under above-cited methods (1) or (2).						below the established standard (i.e., LOS E or LOS F), Chevron has worked with the City of Richmond Public Works Department and in coordination with the Contra Costa County Public Works Department as necessary to implement one or more of the specified measures during the construction period. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
4.16-12: Chevron shall post the correct emergency information at the Richmond Lane rail spur crossings in accordance with GO 75-D and evidence of compliance shall be provided to the City prior to issuance of any building or grading permits. All construction located near the rail track within the Project site shall comply with the Public Utilities Commission's General Orders (GO). Details on the Commission's General Orders are located here: http://www.cpuc.ca.gov/crossings. These General Orders consist of: ▪ GO 26-D: Clearances on railroads and street railroads as to side and overhead structures, parallel tracks and crossings ▪ GO 72-B: Construction and Maintenance – Standard types of pavement construction at railroad grade crossings	Chevron	Prior to grading permit issuance	City of Richmond Public Works Department	Review and verification prior to grading permit issuance.	Y	Chevron submitted a report to the City on February 10, 2016 documenting compliance with this Mitigation Measure. **Chevron has implemented this mitigation measure, and this measure will not be addressed in future annual reports.**

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
▪ GO 75-D: Warning Devices for at-grade railroad crossings ▪ GO 88-B: Alterations of railroad crossings ▪ GO 118: Construction, reconstruction and maintenance of walkways and control, of vegetation adjacent to railroad tracks.						
4.17 UTILITIES AND SERVICES						
Construction or operation of the Project would result in no-significant impacts related to utilities and services. No mitigation is required.						

Improvement Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
4.3-3: The Modernization Project shall implement reasonable and prudent practices to reduce PM_{10} and $PM_{2.5}$ emissions from construction equipment to further reduce this less-than-significant impact. Such practices may include, but are not limited to, the following: 3a: Idling time of diesel-powered construction equipment shall be minimized. 3b: Off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) shall be newer, since newer equipment may achieve a Project-wide fleet-average 20% NO_x reduction, and 45% PM reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions include the use of late-model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available. 3c: All construction equipment, diesel trucks, and generators shall be equipped with Best Available Control Technology for emission reductions of NO_x and PM. 3d: Contractors should use equipment that meets CARB's most recent certification standard for off-road heavy duty diesel engines.	Chevron/Project Contractor	During construction activities	Chevron, BAAQMD and, City of Richmond Building Division and Engineering Services Department	Review and verification, regularly during construction	Y	See MM 4.3-1, MM 4.3-2a and MM 4.8-1.

Improvement Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
4.14 PUBLIC SERVICES						
4.14-1: 1a: During the construction phase, Chevron shall hire additional security services as necessary to compensate for the increase in personnel on-site. 1b: Mitigation Measures 4.16-1 through 4.16-5 and Improvement Measure 4.16-1 through 9 (see Section 4.16, Transportation and Traffic) shall be implemented to reduce the demand for help from the Richmond Police Department for traffic-related issues.	Chevron/Project Contractor	During construction	City of Richmond Public Safety Department	Review and verification, continuous during construction	Y	Chevron has and will continue to hire additional security services if necessary to compensate for the increase in personnel onsite during construction. Security staffing numbers are adjusted anytime there is a significant increase in onsite workers, whether due to major construction of a project within the Refinery, or to a large Refinery turnaround. The number of security guards hired for the Project has been adjusted as the number of workers have increased. Chevron's implementation of this measure in 2022, as applicable, is reported in quarterly construction questionnaires. See Attachment 3.
4.14-2: Chevron and the Richmond Fire Department shall establish an agreement that ensures training on new equipment and the acquisition of any necessary heavy equipment (e.g., large diameter hoses, large scale pumping equipment).	Chevron/Project Contractor and City of Richmond Fire Department	During construction, prior to and during operations	City of Richmond Fire Department	Review and verification, continuous during construction, prior to and during operations	Y	Chevron Fire Department works closely with the Richmond Fire Department (RFD) to ensure RFD receives adequate training and has the necessary equipment. RFD has not yet identified the need for additional training or equipment at this time.
4.16 TRANSPORTATION						
4.16-1 through 9: Chevron shall implement one or more of the following measures to further reduce Modernization Project construction impacts by reducing construction-related traffic trips during the AM and PM peak hours. 1 through 9a: Chevron shall stagger the hours of operation of the craft labor so that the construction-related traffic would be distributed over the peak and non-peak hours of traffic operation. 1 through 9b: Chevron shall promote the use of car-sharing by the craft labor. 1 through 9c: Chevron shall coordinate the schedule among construction of the Modernization Project, construction of the other projects, and the major facility turnaround to minimize combined traffic generation on any single day.	Chevron/Project Contractor	During construction	City of Richmond Public Works Department	Review and verification, continuous during construction	Y	Chevron has staggered the hours of operation of the craft labor so that the construction-related traffic is distributed over the peak and non-peak hours of traffic operation. The Project has managed start of shift times in conjunction with Routine and Turnaround Maintenance. The times were chosen to allow the least congestion at 91 Gate and Castro Street for all of Maintenance. Chevron has and will continue to promote the use of car-sharing by the craft labor. Chevron has coordinated the Modernization Project construction schedule, construction of other projects, and major facility turnarounds to

Improvement Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
						minimize combined traffic generation on any single day.
4.17 UTILITIES AND SERVICES						
4.17-1: Prior to issuance of a demolition, grading, or building permit, Chevron shall submit a Debris Recovery Plan and Debris Recovery Report demonstrating that at least 50% of the construction and demolition debris generated on the jobsite is reused, recycled, or otherwise diverted. The Debris Recovery Plan shall be submitted to the City for review and approval.	Chevron/Project Contractor	Prior to issuance of a demolition, grading, or building permit	City of Richmond Building Division and Engineering Services Department	Review Debris Recovery Plan and Debris Recovery Report prior to issuance of a demolition, grading, or building permit	Y	Chevron submitted a Debris Recovery Plan to the City of Richmond addressing this measure on March 25, 2016.

EXCERPTS FROM CHEVRON LONG WHARF MARINE TERMINAL EIR – MITIGATION MEASURE MONITORING AND REPORTING PROGRAM

Impact	Mitigation Measure	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Agency	Timing	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
OS-3: Chevron's response capability for containment of spills during transfer operations would result in adverse and significant impacts for spills greater than 50 bbls. Consequences would range from spills that can be contained during first response efforts with rapid cleanup (Class II), to those complex spills that result in a significant impact (Class I) with residual effects after mitigation.	**OS-3b:** Install tension-monitoring devices at Berth 1 to monitor mooring lines and avoid excessive tension or slack conditions that could result in spills. An alarm system (visual and sound) that incorporates communication to the control-building operator shall also be a part of the system. In addition, if any vessel drifts (surge or sway) more than 7 feet from its normal manifold or loading arm position at any other terminal berth, Chevron shall install, within 6 months after the incident, tension-monitoring devices at such berth.	CSLC monitor to observe devices after installation.	Reduces potential for damages and spills.	CSLC	Within 12 months of lease implementation, unless otherwise specified. If any vessel drifts more than 7 feet from its normal position, install within 6 months of occurrence.	Y	Chevron implements these mitigation measures pursuant to its 2009 lease with California State Lands Commission and provides regular reports to the CSLC pursuant to the lease. Copies of the reports are available from CSLC or Chevron.

Impact	Mitigation Measure	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Agency	Timing	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
	OS-3c: Install Allision Avoidance System (AAS) at the terminal to prevent damage to the pier and/or vessel during docking operations. Prior to implementing this measure, Chevron shall consult with the San Francisco Bar Pilots, the U.S. Coast Guard, and the staff of the CSLC and provide information that would allow the CSLC to determine, on the basis of such consultations and information regarding the nature, extent and adequacy of the existing berthing system, the most appropriate application and timing of an AAS at the Chevron Long Wharf.	CSLC monitor to observe devices after installation.	Reduces potential for damages and spills.	CSLC	Within 12 months of lease implementation, unless otherwise specified.	Y	See MM OS-3b.
OS-4: Group V oils have a specific gravity greater than 1 and do not float on the water; instead, they will sink below the surface into the water column or possibly to the bottom. Chevron states in their Spill Preparedness and Emergency Response Plan that no reasonable technology currently exists for a Group V response in the San Francisco Bay. Thus, a release of a Group V oil could result in significant impacts (Class I).	**OS-4:** Chevron shall confer with the California State Lands Commission (CSLC) regarding Group V oil spill response technology including potential new response equipment and techniques that may be applicable for use at the Long Wharf. Chevron shall work with the CSLC in applying these new technologies, as agreed upon, if recommended for this facility.	Chevron shall submit biannual report on status of new technology and equipment to CSLC.	Provides flexibility in lease to up MM and improve response capability.	CSLC	Submit biannual report for life of lease.	Y	See MM OS-3b.
OS-6: Public areas are beyond the hazard footprint boundary; thus fires and explosions would not cause a public safety risk. However, the Wharf's Operations Manual does not address fire	**OS-6b:** Chevron shall develop a set of procedures and conduct training and drills for dealing with tank vessel fires and explosions for tankers berthed at the Long Wharf. The procedures should include the steps to follow in the event of a	Chevron shall prepare and submit procedures to CSLC and US Coast Guard for review and approval.	Provides planning and procedures for emergency response.	CSLC	Submit to CSLC within 90 days of lease implementation.	Y	See MM OS-3b.

Impact	Mitigation Measure	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Agency	Timing	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
emergency procedures and a fire and/or explosion could lead to a release of oil. Since MOTEMS became effective, February 6, 2006, Chevron is required to be consistent with the requirements of sections 3102F3.8 and 3108F2.2 of 24 CCR, Part 2, California Building Code, Chapter 31F for a MOT Fire Plan.	tank vessel fire and describe how Chevron and the vessel will coordinate activities. The procedures shall also identify other capabilities that can be procured if necessary in the event of a major incident. The procedures shall be submitted to the U.S. Coast Guard and California State Lands Commission within 90 days of lease renewal.						
OS-7: Spills from accidents in the Bay could result in impacts to water quality or biological resources that could be significant adverse (Class II) impacts for those that can be contained during first response efforts; or significant adverse (Class I) impacts that would have residual impacts. While Chevron does not have legal responsibility for tankers it does not own, it does have responsibility to participate in improving general response capabilities.	**OS-7a:** Chevron shall participate in an analysis to determine the adequacy of the existing VTS in the Bay Area, if such a study is conducted by a Federal, State, or local agency during the life of the lease. Agencies such as the San Francisco Bay Harbor Safety Committee often conduct studies of safety issues within the Bay Area. As vessel traffic increases in and around the Bay Area and as technology improves, it may be necessary and feasible to upgrade and expand the VTS in and around the Bay Area. Chevron shall participate in this analysis and contribute a pro-rata share toward the upgrade and expansion of the system, if required to do so by the CSLC.	This shall be implemented as a lease condition. Chevron shall demonstrate to CSLC their participation in program strategies to protect sensitive resources.	Reduces potential damage to resources.	CSLC	Life of lease.	Y	See MM OS-3b.
	OS-7b: Chevron shall respond to any spill from a vessel traveling to or from the wharf, moored at its wharf, related in any way to the wharf, or carrying cargo owned by Chevron, as if it were its own,	This shall be implemented as a lease condition. CSLC monitor to observe emergency actions.	Reduces potential damage to resources.	CSLC	Life of lease.	Y	See MM OS-3b.

Impact	Mitigation Measure	Monitoring/ Reporting Action	Effectiveness Criteria	Responsible Agency	Timing	Compliance (Y, N, N/A)	Explanation of Compliance Including Timing
	without assuming liability, until such time as the vessel's response organization can take over management of the response actions in a coordinated manner.						

ATTACHMENT 3
Quarterly Construction
Questionnaires Operational Year 2022

Chevron Richmond Modernizati

Question Category	Question Number	Reference Citation(MM#/COA#)	Question
Ground Disturbing Construction Questions	4.1.1		Have any ground disturbing construction activities occurred?
Ground Disturbing Construction Questions	4.2.1	4.5-1	Was training regarding discovery of archaeological artifacts/resources provided to workers before ground disturbing activities began? (4.5-1) If no, please explain by entering a comment. If yes please attach proof.
Ground Disturbing Construction Questions	4.2.2	4.5-1	Is monitoring being conducted for discovery of archaeological resources during construction? (4.5-1) If no, please explain by entering a comment. If yes please attach proof.
Ground Disturbing Construction Questions	4.2.3	4.5-1	Have all archaeological resources discovered been managed as required? (4.5-1) If no, please explain by entering a comment. If yes please attach proof.
Ground Disturbing Construction Questions	4.2.4	4.5-2	Was training regarding discovery of paleontological resources provided to workers before ground disturbing activities began? (4.5-2) If no, please explain by entering a comment. If yes please attach proof.
Ground Disturbing Construction Questions	4.2.5	4.5-2	Have excavation plans been submitted, if required for all needed excavations? (4.5-2) If no, please explain by entering a comment. If yes please attach proof.
Ground Disturbing Construction Questions	4.2.6	4.5-2	Have all paleontological resources discovered been managed as required? (4.5-2) If no, please explain by entering a comment. If yes please attach proof.
Ground Disturbing Construction Questions	4.2.7	4.5-3	Have any human skeletal remains been discovered? (4.5-3)
Ground Disturbing Construction Questions	4.2.8	4.5-3	If human skeletal remains have been discovered, have they been managed as required? (4.5-3) If No, please explain by entering a comment. If Yes, please attach proof.
GHG Emissions	6.1.1	4.8-1l	Have GHG emissions from Project construction activities for a year exceeded 10,000 MT CO2e, after accounting for reductions realized from mitigation measures? (4.8-1l)
GHG Emissions	6.1.2	4.8-1l	If yes, has Chevron implemented one or more of the specified measures to reduce GHG emissions to below 10,000 MT CO2e? (4.8-1l)If no, please explain by entering a comment. If yes please attach proof.
GHG Emissions	6.1.3	4.8-2	Has Chevron implemented mitigation measures 4.8-2a through 4.8-2c to reduce greenhouse gas emissions? (4.8-2) If no, please explain by entering a comment. If yes, please attach proof
GHG Emissions	6.1.4	4.8-2e	Has Chevron provided its annual contribution to fund the Community Greenhouse Gas Reduction Measures? (4.8-2e) If no, please explain by entering a comment. If yes, please attach proof.
Contaminated Soil	10.1.1		Has Project construction generated any contaminated soil?
Contaminated Soil	10.2.1	4.9-2	If yes, has contaminated soil been handled and disposed of as required including covering with plastic sheeting of any soil stockpiles containing contaminants? (4.9-2) If no, please explain by entering a comment. If yes please attach proof.
Contaminated Soil	10.3.1	4.13-10a	Has any contaminated soil been discovered during Project construction? (4.13-10a)
Contaminated Soil	10.4.1	4.13-10a	If Yes, did Chevron report the discovery to the City and other agencies? (4.13-10a) If no, please explain by entering a comment. If yes please attach proof.
Contaminated Soil	10.4.2	4.13-10a	Did Chevron promptly manage, contain, treat, transport, and dispose of it? (4.13-10a) If no, please explain by entering a comment. If yes please attach proof.
Contaminated Soil	10.4.3	4.13-10a	Did Chevron use authorized remediation contractors to manage contaminated media discovered during construction? (4.13-10a) If no, please explain by entering a comment. If yes please attach proof.

Nighttime Construction	12.1.1		Has Project construction included any nighttime construction activities?
Nighttime Construction	12.2.1	4.11-1	Have nighttime construction noise mitigation requirements been implemented? (4.11-1) If no, please explain by entering a comment. If yes please attach proof.
Nighttime Construction	12.2.2		Has there been a verified complaint regarding backup alarm noise during nighttime construction activities?
Nighttime Construction	12.2.3	4.11-1b	If Yes, have administrative controls or different alarms been implemented? (4.11-1b) If no, please explain by entering a comment. If yes please attach proof.
Spills or Releases	14.1.1		Have there been any spills/releases of any hazardous substances?
Spills or Releases	14.2.1	4.13-5c	If Yes, did Chevron report the release within 48 hours to the City? (4.13-5c) If no, please explain by entering a comment. If yes please attach proof.
Spills or Releases	14.2.2	4.13-5c	Did Chevron report the release to all required agencies in accordance with applicable regulatory requirements? (4.13-5c) If no, please explain by entering a comment. If yes please attach proof.
Spills or Releases	14.2.3	4.13-5c	Was a prompt cleanup conducted? (4.13-5c) If no, please explain by entering a comment. If yes please attach proof.
Third Party Compliance Audit	16.1.1	4.13-13c	Has the City or CCHS retained a third-party expert to audit compliance at the facility? (4.13-13c)
Third Party Compliance Audit	16.1.2	4.13-13c	If Yes, Has Chevron reimbursed the City or CCHS for these fees/expenses? (4.13-13c)
Miscellaneous	19.1.5	4.3-1	Are all required dust control BMPs being implemented consistently? (4.3-1) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.6	IM 4.3-3	Has Chevron implemented the required PM emissions reduction practices for construction activities? (IM 4.3-3) If no, please explain by entering a comment.
Miscellaneous	19.1.7	4.13-2a	Have hazardous materials been stored only in City-approved locations? (4.13-2a) If no, please explain by entering a comment.
Miscellaneous	19.1.8	4.13-3a	Has hazardous waste been stored only in locations approved by the City? (4.13-3a) If no, please explain by entering a comment.
Miscellaneous	19.1.9	4.13-3b	Has all hazardous waste been transported off-site to an authorized facility by a licensed transporter within 90 days after the wastes were generated? (4.13-3b) If no, please explain by entering a comment.
Miscellaneous	19.1.10	4.13-3c	Has all non-hazardous waste been transported off-site to an authorized facility by a licensed transporter within 180 days after the wastes were generated? (4.13-3c) If no, please explain by entering a comment.
Miscellaneous	19.1.12	4.13-7d	Has Chevron reimbursed the City for any 3rd party experts retained by the City or CCHS to review PHAs, ISSAs, or LOPAs? (4.13-7d)
Miscellaneous	19.1.13	4.13-10a	Has Chevron trained construction workers in recognizing contamination and characterizing/managing any contaminated media? (4.13-10a) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.14	4.16-1, 3, 6	Has Chevron coordinated with the City and CalTrans to implement modified traffic controls at peak PM hours per the specified methods for the Castro/W-180 westbound ramps? (4.16-1, 3, 6) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.
Miscellaneous	19.1.15	4.16-2, 5, 9	Has Chevron coordinated with the City and CalTrans to implement modified traffic controls at peak PM hours per the specified methods for Richmond Parkway/Gertrude Ave? (4.16-2, 5, 9) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.

Miscellaneous	19.1.16	4.16-4, 8	For periods during which there is/will be both Project construction-related traffic combined with Other Project construction-related traffic, has Chevron coordinated with the City and CalTrans to implement modified traffic controls at peak PM hours per the specified methods for Castro/Hensley? (4.16-4, 8) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.
Miscellaneous	19.1.17	4.16-7	For periods during which there is/will be Project construction-related traffic combined with Other Project construction-related traffic combined with traffic related to a major turnaround, have the traffic measures specified for Castro Street/General Chemical Access been implemented? (4.16-7) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.18	4.16-11	For periods during which there will be Project construction-related traffic combined with Other Project construction-related traffic combined with traffic related to a major turnaround, have the traffic measures specified for County maintained intersections been implemented by Chevron in coordination with the City and County? (4.16-11) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.
Miscellaneous	19.1.19	4.16-1, 2a, 4, 7, 11	Has Chevron paid the full costs of modified traffic controls? (4.16-1, 2a, 4, 7, 11) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.20	4.14-1	Has Chevron hired additional security services as necessary for the increase in personnel on-site during construction? (IM 4.14-1) If No, please explain by entering a comment.
Miscellaneous	19.1.23	4.13-2b	Has Chevron communicated on a weekly basis to site management and City management regarding the week's construction plans and schedule? (4.13-2b) If No, please explain by entering a comment.
Miscellaneous	19.1.29	4.9-2	Have stockpiles of soil containing contaminants been kept covered with plastic sheeting? (4.9-2) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.34	4.13-13b	Has Chevron funded the costs of a qualified expert in refinery safety to be selected and retained by County or City to review ISSAs, PHAs, LOPAs and other safety documentation (until such time as funded via RISO)? (4.13-13b) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.35	4.13-13d	Has Chevron submitted quarterly reports to City (and copies to CCHS) on the status of corrective actions taken to implement agency recommendations resulting from August 2012 fire as well as corrective actions taken by Chevron as a result of its own investigation? (4.13-13d) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.36	4.13-13e	Has Chevron funded the City's coordination with CSB, CalOSHA, BAAQMD, and EPA on their investigations? (4.13-13e) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.37	4.3-2a, 2b, 4.8-1	Has Chevron submitted its most current quarterly mitigation measure compliance report demonstrating compliance with the required NOx, ROG, and GHG measures? (4.3-2a, 2b, 4.8-1) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.38	4.8-1l	Has a third-party retained by Chevron quantified and verified the GHG emissions reductions achieved by the specified mitigation measures for construction activities? (4.8-1l) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.39	4.8-1l	Has Chevron submitted an annual report for the most current reporting period verifying GHG emissions reductions from construction activities, reductions achieved through mitigation, and compliance with mitigation requirements? (4.8-1l) If no, please explain by entering a comment. If yes please attach proof.

Miscellaneous	19.1.41	COA G2, H5	Has Chevron submitted annual compliance reports by March 31 of each year (starting after the first full year of construction) to the City regarding the status of any ongoing agency investigations resulting from the August 2012 fire, including EPA, CSB, Cal/OSHA, BAAQMD, and the County, including County safety audit(s) and safety culture audit(s), including a comprehensive list of all findings, corrective actions identified/requested by the agencies, and status of implementation by Chevron of the corrective actions? (COA G2, H5) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.43	COA H5	Has Chevron submitted payment to the County to cover all County costs, staff time, and third party fees and costs associated with any mitigation measure in accordance with a payment scheduled determined by the County? (COA H5)
Miscellaneous	19.1.44	COA H5	Has Chevron submitted payment to the BAAQMD to cover all BAAQMD costs, staff time, and third party fees and costs associated with any mitigation measure in accordance with a payment scheduled determined by the BAAQMD? (COA H5)
Final Certifications	20.1.1		I (Enter name or names in text box to the right) certify that this response and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of those who manage the system or who gather the information, I attest on behalf of Chevron that all information provided in this response is, to the best of my knowledge and belief, true, accurate, and complete.

on Project 1Q2022 Submitted Questionnaire Review

Chevron Response	Chevron Comments	Document Uploaded by Chevron
Yes	Ground disturbing activities occurred in Q1 2022. Past ground disturbing activities have been reported in previous quarterly construction questionnaires and iEHS reports.	
Yes	Chevron issues an “Instructions to Contractors” (ITC) document (attached) to contractors that specifies the requirements of MM 4.5-1 (see section 2.9 of the ITC). Cultural resources refresher training for contractors was completed for the construction activity in Q32021.	4.2.01_ITC Procedure Rev-8 03-28-17.pdf
Yes	Chevron issues an “Instructions to Contractors” (ITC) document (attached to 4.2.01) to contractors that specifies the requirements of MM 4.5-1 (see section 2.9 of the ITC). Cultural resources refresher training for contractors was completed for the construction activity in Q32021.	
N/A	No archaeological resources have been discovered to date.	
Yes	Chevron issues an “Instructions to Contractors” (ITC) document (attached to 4.2.01) to contractors that specifies the requirements of MM 4.5-1 (see section 2.9 of the ITC). Cultural resources refresher training for contractors was completed for the construction activity in Q32021.	
Yes		
N/A	No paleontological discoveries have been made to date.	
No		
N/A	No skeletal remains have been discovered to date.	
Yes	As previously reported in the 4Q2018 construction emissions report, construction-related GHG emissions did exceed 10,000 MT CO2e in 2018. In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. Construction for this project commenced on 5/17/2021 and was completed Q1 2022.	
Yes	In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. Construction for this project commenced on 5/17/2021 and was completed Q1 2022.	
Yes	In accordance with COR memo dated 8/31/2018, Chevron has implemented the Wastewater Reuse Project and provided funding in the amount of $2MM in lieu of the FCC PDF and for the delay of the LED lighting (see attached). LED lighting is scheduled for implementation over a 10 year period.	6.1.03_Chevron Check No 0024121959.pdf 6.1.03_COR Memo to file re PDF and Permasense.pdf
Yes	Chevron provided its seventh annual contribution via ACH payment. The City confirmed receipt of payment on June 3, 2021 via email. The CGGRP contribution is included in the funding under the ECIA.	___EXTERNAL___ RE_ Chevron Richmond_ Annual Modernization ECIA Payment No_ 7.msg
Yes	No contaminated soil was generated by Project construction activity in Q1 2022. In previous quarters, the project has generated contaminated soil. Identification, management, storage, and shipment of this contaminated soil is managed by the Refinery's existing Hazardous Waste Group in accordance with the applicable regulations and best practices, including BMPs WM-3 Stockpile Management, WM-7 Contaminated Soil Management, and CCR Title 22, Division 4.5 Standards for the Management of Hazardous Wastes.	
Yes	Refinery Instructions 505, Excavation Procedures, and 506, Hazardous Waste Management, were included in construction contracts and provide guidance on managing excavations and waste streams. Chevron has issued an “Instructions to Contractors” document to contractors that specifies the requirements of MM 4.13-10a and has reviewed this requirement in the ITC meetings. The Refinery Hazardous Waste Team characterizes and manages soils according to applicable regulations.	
No	No contaminated soils requiring agency notifications have been discovered. See also the response to question 19.1.13.	
N/A		
N/A		
N/A		

No	Nighttime construction activities did not occur in Q1 2022.	
N/A	Nighttime construction activities did not occur in Q1 2022. Past nighttime construction activities were not the type identified in the EIR as those which would potentially exceed noise significance thresholds. Further, Chevron has not received any noise complaints which would trigger additional mitigation obligations.	
N/A		
N/A		
No		
N/A		
N/A		
N/A		
No	CCHS personnel have performed onsite verification and have not retained a third-party expert to-date.	
N/A		
Yes	All required dust control BMPs are being implemented consistently as described in the Instructions to Contractors (ITC) document attached to question 4.2.01.	
Yes	Chevron has implemented Improvement Measure 4.3-3 through the “Instructions to Contractors” (ITC) document. Please see attachment to 4.2.01.	
Yes	Hazardous materials are stored within approved locations as identified within Figure 3-1 of the EIR. Small quantities of consumer products that might be classified as hazardous materials are also stored in OSHA regulated storage cabinets located within construction areas where the City approved construction activities are occurring. All construction activities are subject to the requirements of the City issued building permits.	
Yes	Chevron has developed a “Waste Diversion Plan/Debris Recovery Plan” (Plan) that identifies acceptable waste storage locations. The Plan was approved by the City of Richmond on May 17, 2016 and is attached to the “Instructions to Contractors” document (see 4.2.01). Acceptable waste storage locations are identified in the Plan as referenced under MM 3.13-3a. Contractors have been trained on the Plan and are responsible for complying with all of its provisions.	
Yes		
Yes		
Have not received invoice	CCHS personnel have performed onsite verification and have not retained a third-party expert to-date.	
Yes	Refinery Instructions 505, Excavation Procedures, and 506, Hazardous Waste Management, were included in construction contracts and provide guidance on managing excavations and waste streams. Chevron has issued an “Instructions to Contractors” (ITC) document to contractors (attached to 4.2.01) that specifies the requirements of MM 4.13-10a (see section 2.0 of the ITC) and has reviewed this requirement in ITC meetings. The Refinery Hazardous Waste Team characterizes and manages any contaminated media.	
Yes	Chevron has held periodic traffic coordination and planning meetings with representatives from the City of Richmond Engineering, Police, and Traffic Departments. The purpose of these meetings has been to plan for implementation of the modified traffic controls. The City has contracted with St. Francis Electrical, which has prepared signal timing modifications and other changes to ensure smooth traffic flow for the Castro/W-580 westbound ramps.	
Yes	Chevron has been in communication with representatives from the City of Richmond Engineering, Police and Traffic Departments. The purpose of the communication has been to discuss adequacy of traffic controls. The City has contracted with St. Francis Electrical, which has prepared signal timing modifications and other changes to ensure smooth traffic flow for the Richmond Parkway/Gertrude Ave. intersection. See attachment.	Chevron Richmond Modernization Project - MM 4 16-11 Traffic Data.msg

Yes	Chevron has held periodic traffic coordination and planning meetings with representatives from the City of Richmond Engineering, Police and Traffic Departments. The purpose of these meetings has been to plan for implementation of the modified traffic controls. The City has contracted with St. Francis Electrical, which has prepared signal timing modifications and other changes to ensure smooth traffic flow for the Castro/Hensley intersection. See also attachment to 19.1.15.	
Yes	As with previous major Refinery turnarounds which occurred after the start of the Modernization Project construction, Chevron is working closely with the City of Richmond Engineering, Police, and Traffic Departments to implement traffic control measures to ensure smooth traffic flow during peak arrival and departure periods. See also attachment to 19.1.15.	
Yes	As with previous major Refinery turnarounds which occurred after the start of the Modernization Project construction, Chevron is working closely with the City of Richmond Engineering, Police, and Traffic Departments to implement traffic control measures to ensure smooth traffic flow during peak arrival and departure periods. See also attachment to 19.1.15.	
Yes	Chevron has paid all invoices to date for St. Francis Electrical, the City of Richmond's traffic management contractor, and is set to pay all future traffic costs.	
Yes		
Yes	Refinery site management took ownership of the Modernization Project construction following commencement of Project operations. Chevron's permitting teams are in regular contact with the City's building inspection department concerning ongoing permitting and construction activities.	
Yes	Chevron has issued an "Instructions to Contractors" (ITC) document to contractors that specifies the requirements of MM 4.9-2 (see section 2.0 of the ITC) including Best Management Practices. Please see attachment to 4.2.01. The Chevron Modernization Compliance Team verifies compliance with these requirements.	
Yes	The County has selected the qualified expert. Chevron will pay invoices for this expert upon receipt. See attachment to 19.1.43.	
Yes	The twenty-fourth quarterly 4.13-13d report is attached. The 24th submittal is the final report prepared under the quarterly reporting requirement. All corrective actions taken to implement agency recommendations and as a result of Chevron's internal investigation have been implemented and, where required, integrated into Chevron's maintenance and operating procedures.	Transmittal 1_24 MM4_13-13d Quarterly Report .msg
No	Chevron has not been invoiced for, nor notified of, the City's coordination with CSB, CalOSHA, BAAQMD, and EPA on their investigations.	
Yes	See Transmittal #19.21 attached.	Refinery Modernization Project - Transmittal #19_21 Construction Emissions Report_ First Quarter 2022.msg
No	Chevron has worked with the City's independent environmental consultant, Ramboll, to develop a construction emissions tracking tool that takes into account quantifiable reductions. Please see question 19.1.37 for an update concerning current construction emissions.	
Yes	Please see question 19.1.37 for an update concerning current construction emissions.	

Yes	At the June 6, 2019 Planning Commission Hearing, the City approved submittal of subsequent annual reports by September 1 starting in 2020 to align with Report inputs from other regulatory agency submittals. The City subsequently extended the due date until September 8 for report year 2019. Chevron submitted the annual compliance report for report year 2019 on September 4, 2020. Chevron submitted the annual compliance report for report year 2020 on August 31, 2021. See attached transmittals.	Transmittal #25 CUP H5 Annual Compliance Report.msg
Yes	Chevron has paid or is in the process of paying all invoices received from the County as of the date of report submittal.	19.1.43_CCHS Invoice No HM-Chevron-1712.pdf 19.1.43_Payment HM-Chevron-1712.pdf 19.1.43_CCHS Invoice No HM-Chevron-1713.pdf
Have not received invoice		
Ashley Demcsak for Shawn Lee		

Chevron Richmond Modernizati

Question Category	Question Number	Reference Citation(MM#/COA#)	Question
Ground Disturbing Construction Questions	4.1.1		Have any ground disturbing construction activities occurred?
Ground Disturbing Construction Questions	4.2.1	4.5-1	Was training regarding discovery of archaeological artifacts/resources provided to workers before ground disturbing activities began? (4.5-1) If no, please explain by entering a comment. If yes please attach proof.
Ground Disturbing Construction Questions	4.2.2	4.5-1	Is monitoring being conducted for discovery of archaeological resources during construction? (4.5-1) If no, please explain by entering a comment. If yes please attach proof.
Ground Disturbing Construction Questions	4.2.3	4.5-1	Have all archaeological resources discovered been managed as required? (4.5-1) If no, please explain by entering a comment. If yes please attach proof.
Ground Disturbing Construction Questions	4.2.4	4.5-2	Was training regarding discovery of paleontological resources provided to workers before ground disturbing activities began? (4.5-2) If no, please explain by entering a comment. If yes please attach proof.
Ground Disturbing Construction Questions	4.2.5	4.5-2	Have excavation plans been submitted, if required for all needed excavations? (4.5-2) If no, please explain by entering a comment. If yes please attach proof.
Ground Disturbing Construction Questions	4.2.6	4.5-2	Have all paleontological resources discovered been managed as required? (4.5-2) If no, please explain by entering a comment. If yes please attach proof.
Ground Disturbing Construction Questions	4.2.7	4.5-3	Have any human skeletal remains been discovered? (4.5-3)
Ground Disturbing Construction Questions	4.2.8	4.5-3	If human skeletal remains have been discovered, have they been managed as required? (4.5-3) If No, please explain by entering a comment. If Yes, please attach proof.
GHG Emissions	6.1.1	4.8-1l	Have GHG emissions from Project construction activities for a year exceeded 10,000 MT CO2e, after accounting for reductions realized from mitigation measures? (4.8-1l)
GHG Emissions	6.1.2	4.8-1l	If yes, has Chevron implemented one or more of the specified measures to reduce GHG emissions to below 10,000 MT CO2e? (4.8-1l)If no, please explain by entering a comment. If yes please attach proof.
GHG Emissions	6.1.3	4.8-2	Has Chevron implemented mitigation measures 4.8-2a through 4.8-2c to reduce greenhouse gas emissions? (4.8-2) If no, please explain by entering a comment. If yes, please attach proof
GHG Emissions	6.1.4	4.8-2e	Has Chevron provided its annual contribution to fund the Community Greenhouse Gas Reduction Measures? (4.8-2e) If no, please explain by entering a comment. If yes, please attach proof.
Contaminated Soil	10.1.1		Has Project construction generated any contaminated soil?
Contaminated Soil	10.2.1	4.9-2	If yes, has contaminated soil been handled and disposed of as required including covering with plastic sheeting of any soil stockpiles containing contaminants? (4.9-2) If no, please explain by entering a comment. If yes please attach proof.
Contaminated Soil	10.3.1	4.13-10a	Has any contaminated soil been discovered during Project construction? (4.13-10a)
Contaminated Soil	10.4.1	4.13-10a	If Yes, did Chevron report the discovery to the City and other agencies? (4.13-10a) If no, please explain by entering a comment. If yes please attach proof.
Contaminated Soil	10.4.2	4.13-10a	Did Chevron promptly manage, contain, treat, transport, and dispose of it? (4.13-10a) If no, please explain by entering a comment. If yes please attach proof.

Contaminated Soil	10.4.3	4.13-10a	Did Chevron use authorized remediation contractors to manage contaminated media discovered during construction? (4.13-10a) If no, please explain by entering a comment. If yes please attach proof.
Nighttime Construction	12.1.1		Has Project construction included any nighttime construction activities?
Nighttime Construction	12.2.1	4.11-1	Have nighttime construction noise mitigation requirements been implemented? (4.11-1) If no, please explain by entering a comment. If yes please attach proof.
Nighttime Construction	12.2.2		Has there been a verified complaint regarding backup alarm noise during nighttime construction activities?
Nighttime Construction	12.2.3	4.11-1b	If Yes, have administrative controls or different alarms been implemented? (4.11-1b) If no, please explain by entering a comment. If yes please attach proof.
Spills or Releases	14.1.1		Have there been any spills/releases of any hazardous substances?
Spills or Releases	14.2.1	4.13-5c	If Yes, did Chevron report the release within 48 hours to the City? (4.13-5c) If no, please explain by entering a comment. If yes please attach proof.
Spills or Releases	14.2.2	4.13-5c	Did Chevron report the release to all required agencies in accordance with applicable regulatory requirements? (4.13-5c) If no, please explain by entering a comment. If yes please attach proof.
Spills or Releases	14.2.3	4.13-5c	Was a prompt cleanup conducted? (4.13-5c) If no, please explain by entering a comment. If yes please attach proof.
Third Party Compliance Audit	16.1.1	4.13-13c	Has the City or CCHS retained a third-party expert to audit compliance at the facility? (4.13-13c)
Third Party Compliance Audit	16.1.2	4.13-13c	If Yes, Has Chevron reimbursed the City or CCHS for these fees/expenses? (4.13-13c)
Miscellaneous	19.1.5	4.3-1	Are all required dust control BMPs being implemented consistently? (4.3-1) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.6	IM 4.3-3	Has Chevron implemented the required PM emissions reduction practices for construction activities? (IM 4.3-3) If no, please explain by entering a comment.
Miscellaneous	19.1.7	4.13-2a	Have hazardous materials been stored only in City-approved locations? (4.13-2a) If no, please explain by entering a comment.
Miscellaneous	19.1.8	4.13-3a	Has hazardous waste been stored only in locations approved by the City? (4.13-3a) If no, please explain by entering a comment.
Miscellaneous	19.1.9	4.13-3b	Has all hazardous waste been transported off-site to an authorized facility by a licensed transporter within 90 days after the wastes were generated? (4.13-3b) If no, please explain by entering a comment.
Miscellaneous	19.1.10	4.13-3c	Has all non-hazardous waste been transported off-site to an authorized facility by a licensed transporter within 180 days after the wastes were generated? (4.13-3c) If no, please explain by entering a comment.
Miscellaneous	19.1.12	4.13-7d	Has Chevron reimbursed the City for any 3rd party experts retained by the City or CCHS to review PHAs, ISSAs, or LOPAs? (4.13-7d)
Miscellaneous	19.1.13	4.13-10a	Has Chevron trained construction workers in recognizing contamination and characterizing/managing any contaminated media? (4.13-10a) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.14	4.16-1, 3, 6	Has Chevron coordinated with the City and CalTrans to implement modified traffic controls at peak PM hours per the specified methods for the Castro/W-180 westbound ramps? (4.16-1, 3, 6) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.

Miscellaneous	19.1.15	4.16-2, 5, 9	Has Chevron coordinated with the City and CalTrans to implement modified traffic controls at peak PM hours per the specified methods for Richmond Parkway/Gertrude Ave? (4.16-2, 5, 9) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.
Miscellaneous	19.1.16	4.16-4, 8	For periods during which there is/will be both Project construction-related traffic combined with Other Project construction-related traffic, has Chevron coordinated with the City and CalTrans to implement modified traffic controls at peak PM hours per the specified methods for Castro/Hensley? (4.16-4, 8) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.
Miscellaneous	19.1.17	4.16-7	For periods during which there is/will be Project construction-related traffic combined with Other Project construction-related traffic combined with traffic related to a major turnaround, have the traffic measures specified for Castro Street/General Chemical Access been implemented? (4.16-7) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.18	4.16-11	For periods during which there will be Project construction-related traffic combined with Other Project construction-related traffic combined with traffic related to a major turnaround, have the traffic measures specified for County maintained intersections been implemented by Chevron in coordination with the City and County? (4.16-11) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.
Miscellaneous	19.1.19	4.16-1, 2a, 4, 7, 11	Has Chevron paid the full costs of modified traffic controls? (4.16-1, 2a, 4, 7, 11) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.20	4.14-1	Has Chevron hired additional security services as necessary for the increase in personnel on-site during construction? (IM 4.14-1) If No, please explain by entering a comment.
Miscellaneous	19.1.23	4.13-2b	Has Chevron communicated on a weekly basis to site management and City management regarding the week's construction plans and schedule? (4.13-2b) If No, please explain by entering a comment.
Miscellaneous	19.1.29	4.9-2	Have stockpiles of soil containing contaminants been kept covered with plastic sheeting? (4.9-2) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.34	4.13-13b	Has Chevron funded the costs of a qualified expert in refinery safety to be selected and retained by County or City to review ISSAs, PHAs, LOPAs and other safety documentation (until such time as funded via RISO)? (4.13-13b) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.35	4.13-13d	Has Chevron submitted quarterly reports to City (and copies to CCHS) on the status of corrective actions taken to implement agency recommendations resulting from August 2012 fire as well as corrective actions taken by Chevron as a result of its own investigation? (4.13-13d) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.36	4.13-13e	Has Chevron funded the City's coordination with CSB, CalOSHA, BAAQMD, and EPA on their investigations? (4.13-13e) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.37	4.3-2a, 2b, 4.8-1	Has Chevron submitted its most current quarterly mitigation measure compliance report demonstrating compliance with the required NOx, ROG, and GHG measures? (4.3-2a, 2b, 4.8-1) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.38	4.8-1l	Has a third-party retained by Chevron quantified and verified the GHG emissions reductions achieved by the specified mitigation measures for construction activities? (4.8-1l) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.39	4.8-1l	Has Chevron submitted an annual report for the most current reporting period verifying GHG emissions reductions from construction activities, reductions achieved through mitigation, and compliance with mitigation requirements? (4.8-1l) If no, please explain by entering a comment. If yes please attach proof.

Miscellaneous	19.1.41	COA G2, H5	Has Chevron submitted annual compliance reports by March 31 of each year (starting after the first full year of construction) to the City regarding the status of any ongoing agency investigations resulting from the August 2012 fire, including EPA, CSB, Cal/OSHA, BAAQMD, and the County, including County safety audit(s) and safety culture audit(s), including a comprehensive list of all findings, corrective actions identified/requested by the agencies, and status of implementation by Chevron of the corrective actions? (COA G2, H5) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.43	COA H5	Has Chevron submitted payment to the County to cover all County costs, staff time, and third party fees and costs associated with any mitigation measure in accordance with a payment scheduled determined by the County? (COA H5)
Miscellaneous	19.1.44	COA H5	Has Chevron submitted payment to the BAAQMD to cover all BAAQMD costs, staff time, and third party fees and costs associated with any mitigation measure in accordance with a payment scheduled determined by the BAAQMD? (COA H5)
Final Certifications	20.1.1		I (Enter name or names in text box to the right) certify that this response and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of those who manage the system or who gather the information, I attest on behalf of Chevron that all information provided in this response is, to the best of my knowledge and belief, true, accurate, and complete.

on Project 2Q2022 Submitted Questionnaire Review

Chevron Response	Chevron Comments	Document Uploaded by Chevron
Yes	Ground disturbing activities did not occur in Q2 2022. Past ground disturbing activities have been reported in previous quarterly construction questionnaires and iEHS reports.	
Yes	Chevron issues an “Instructions to Contractors” (ITC) document (attached) to contractors that specifies the requirements of MM 4.5-1 (see section 2.9 of the ITC). Cultural resources refresher training for contractors was last completed for the construction activity in Q3 2021, and the Refinery plans to complete additional training as needed for future construction-related activities.	4.2.01_ITC Procedure Rev-8 03-28-17.pdf
Yes	Chevron issues an “Instructions to Contractors” (ITC) document (attached to 4.2.01) to contractors that specifies the requirements of MM 4.5-1 (see section 2.9 of the ITC). Cultural resources refresher training for contractors was last completed for the construction activity in Q3 2021, and the Refinery plans to complete additional training as needed for future construction-related activities.	
N/A	No archaeological resources have been discovered to date.	
Yes	Chevron issues an “Instructions to Contractors” (ITC) document (attached to 4.2.01) to contractors that specifies the requirements of MM 4.5-1 (see section 2.9 of the ITC). Cultural resources refresher training for contractors was last completed for the construction activity in Q3 2021, and the Refinery plans to complete additional training as needed for future construction-related activities.	
Yes	No excavation was complete in Q2 2022.	
N/A	No paleontological discoveries have been made to date.	
No		
N/A	No skeletal remains have been discovered to date.	
Yes	As previously reported in the 4Q2018 construction emissions report, construction-related GHG emissions did exceed 10,000 MT CO2e in 2018. In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. Construction for this project commenced on 5/17/2021 and was completed Q1 2022.	
Yes	In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. Construction for this project commenced on 5/17/2021 and was completed Q1 2022.	
Yes	In accordance with COR memo dated 8/31/2018, Chevron has implemented the Wastewater Reuse Project and provided funding in the amount of $2MM in lieu of the FCC PDF and for the delay of the LED lighting (see attached). LED lighting is scheduled for implementation over a 10 year period.	6.1.03_Chevron Check No 0024121959.pdf 6.1.03_COR Memo to file re PDF and Permasense.pdf
Yes	Chevron provided its eighth annual contribution via ACH payment. The City confirmed receipt of payment on June 1, 2022 via email. The CGGRP contribution is included in the funding under the ECIA.	6.1.04_ ECIA Payment 8 Confirmation.msg
Yes	No contaminated soil was generated by Project construction activity in Q2 2022. In previous quarters, the project has generated contaminated soil. Identification, management, storage, and shipment of this contaminated soil is managed by the Refinery’s existing Hazardous Waste Group in accordance with the applicable regulations and best practices, including BMPs WM-3 Stockpile Management, WM-7 Contaminated Soil Management, and CCR Title 22, Division 4.5 Standards for the Management of Hazardous Wastes.	
Yes	Refinery Instructions 505, Excavation Procedures, and 506, Hazardous Waste Management, were included in construction contracts and provide guidance on managing excavations and waste streams. Chevron has issued an “Instructions to Contractors” document to contractors that specifies the requirements of MM 4.13-10a and has reviewed this requirement in the ITC meetings. The Refinery Hazardous Waste Team characterizes and manages soils according to applicable regulations.	
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No	Nighttime construction-related activities did not occur in Q2 2022.	
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No	CCHS personnel have performed onsite verification and have not retained a third-party expert to-date.	
N/A		
Yes	All required dust control BMPs are being implemented consistently as described in the Instructions to Contractors (ITC) document attached to question 4.2.01.	
Yes	Chevron has implemented Improvement Measure 4.3-3 through the “Instructions to Contractors” (ITC) document. Please see attachment to 4.2.01.	
Yes	Hazardous materials are stored within approved locations as identified within Figure 3-1 of the EIR. Small quantities of consumer products that might be classified as hazardous materials are also stored in OSHA regulated storage cabinets located within construction areas where the City approved construction-related activities are occurring. All construction-related activities are subject to the requirements of the City issued building permits.	
Yes	Chevron has developed a “Waste Diversion Plan/Debris Recovery Plan” (Plan) that identifies acceptable waste storage locations. The Plan was approved by the City of Richmond on May 17, 2016 and is attached to the “Instructions to Contractors” document (see 4.2.01). Acceptable waste storage locations are identified in the Plan as referenced under MM 3.13-3a. Contractors have been trained on the Plan and are responsible for complying with all of its provisions.	
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Have not received invoice	CCHS personnel have performed onsite verification and have not retained a third-party expert to-date.	
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Yes	Chevron has been in communication with representatives from the City of Richmond Engineering, Police and Traffic Departments. The purpose of the communication has been to discuss adequacy of traffic controls. The City has contracted with St. Francis Electrical, which has prepared signal timing modifications and other changes to ensure smooth traffic flow for the Richmond Parkway/Gertrude Ave. intersection. See attachment.	Chevron Richmond Modernization Project - MM 4 16-11 Traffic Data.msg
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Yes	As with previous major Refinery turnarounds which occurred after the start of the Modernization Project construction, Chevron is working closely with the City of Richmond Engineering, Police, and Traffic Departments to implement traffic control measures to ensure smooth traffic flow during peak arrival and departure periods. See also attachment to 19.1.15.	
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Yes	Chevron has paid all invoices to date for St. Francis Electrical, the City of Richmond's traffic management contractor, and is set to pay all future traffic costs.	
Yes		
Yes	Refinery site management took ownership of the Modernization Project construction following commencement of Project operations. Chevron's permitting teams are in regular contact with the City's building inspection department concerning ongoing permitting and construction-related activities.	
Yes	Chevron has issued an "Instructions to Contractors" (ITC) document to contractors that specifies the requirements of MM 4.9-2 (see section 2.0 of the ITC) including Best Management Practices. Please see attachment to 4.2.01. The Chevron Modernization Compliance Team verifies compliance with these requirements.	
Yes	The County has selected the qualified expert. Chevron will pay invoices for this expert upon receipt. See attachment to 19.1.43.	
Yes	The twenty-fourth quarterly 4.13-13d report is attached. The 24th submittal is the final report prepared under the quarterly reporting requirement. All corrective actions taken to implement agency recommendations and as a result of Chevron's internal investigation have been implemented and, where required, integrated into Chevron's maintenance and operating procedures.	Transmittal 1_24 MM4_13-13d Quarterly Report .msg
No	Chevron has not been invoiced for, nor notified of, the City's coordination with CSB, CalOSHA, BAAQMD, and EPA on their investigations.	
Yes	See Transmittal #19.22 attached.	Refinery Modernization Project - Transmittal #19_22 Construction Emissions Report_ Second Quarter 2022.msg
No	Chevron has worked with the City's independent environmental consultant, Ramboll, to develop a construction emissions tracking tool that takes into account quantifiable reductions. Please see question 19.1.37 for an update concerning current construction emissions.	
Yes	Please see question 19.1.37 for an update concerning current construction emissions.	

Yes	At the June 6, 2019 Planning Commission Hearing, the City approved submittal of subsequent annual reports by September 1 starting in 2020 to align with Report inputs from other regulatory agency submittals. The City subsequently extended the due date until September 8 for report year 2019. Chevron submitted the annual compliance report for report year 2019 on September 4, 2020. Chevron submitted the annual compliance report for report year 2020 on August 31, 2021. See attached transmittals.	Transmittal #25 CUP H5 Annual Compliance Report.msg
Yes	Chevron has paid or is in the process of paying all invoices received from the County as of the date of report submittal.	19.1.43_CCHS Invoice No HM-Chevron-1712.pdf 19.1.43_Payment HM-Chevron-1712.pdf 19.1.43_CCHS Invoice No HM-Chevron-1713.pdf
Have not received invoice		
Ashley Demcsak for Shawn Lee		

Chevron Richmond Modernizati

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Ground Disturbing Construction Questions	4.1.1		Have any ground disturbing construction activities occurred?
Ground Disturbing Construction Questions	4.2.1	4.5-1	Was training regarding discovery of archaeological artifacts/resources provided to workers before ground disturbing activities began? (4.5-1) If no, please explain by entering a comment. If yes please attach proof.
Ground Disturbing Construction Questions	4.2.2	4.5-1	Is monitoring being conducted for discovery of archaeological resources during construction? (4.5-1) If no, please explain by entering a comment. If yes please attach proof.
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Miscellaneous	19.1.5	4.3-1	Are all required dust control BMPs being implemented consistently? (4.3-1) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.6	IM 4.3-3	Has Chevron implemented the required PM emissions reduction practices for construction activities? (IM 4.3-3) If no, please explain by entering a comment.
Miscellaneous	19.1.7	4.13-2a	Have hazardous materials been stored only in City-approved locations? (4.13-2a) If no, please explain by entering a comment.
Miscellaneous	19.1.8	4.13-3a	Has hazardous waste been stored only in locations approved by the City? (4.13-3a) If no, please explain by entering a comment.
Miscellaneous	19.1.9	4.13-3b	Has all hazardous waste been transported off-site to an authorized facility by a licensed transporter within 90 days after the wastes were generated? (4.13-3b) If no, please explain by entering a comment.
Miscellaneous	19.1.10	4.13-3c	Has all non-hazardous waste been transported off-site to an authorized facility by a licensed transporter within 180 days after the wastes were generated? (4.13-3c) If no, please explain by entering a comment.
Miscellaneous	19.1.12	4.13-7d	Has Chevron reimbursed the City for any 3rd party experts retained by the City or CCHS to review PHAs, ISSAs, or LOPAs? (4.13-7d)
Miscellaneous	19.1.13	4.13-10a	Has Chevron trained construction workers in recognizing contamination and characterizing/managing any contaminated media? (4.13-10a) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.14	4.16-1, 3, 6	Has Chevron coordinated with the City and CalTrans to implement modified traffic controls at peak PM hours per the specified methods for the Castro/W-180 westbound ramps? (4.16-1, 3, 6) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.

Miscellaneous	19.1.15	4.16-2, 5, 9	Has Chevron coordinated with the City and CalTrans to implement modified traffic controls at peak PM hours per the specified methods for Richmond Parkway/Gertrude Ave? (4.16-2, 5, 9) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.
Miscellaneous	19.1.16	4.16-4, 8	For periods during which there is/will be both Project construction-related traffic combined with Other Project construction-related traffic, has Chevron coordinated with the City and CalTrans to implement modified traffic controls at peak PM hours per the specified methods for Castro/Hensley? (4.16-4, 8) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.
Miscellaneous	19.1.17	4.16-7	For periods during which there is/will be Project construction-related traffic combined with Other Project construction-related traffic combined with traffic related to a major turnaround, have the traffic measures specified for Castro Street/General Chemical Access been implemented? (4.16-7) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.18	4.16-11	For periods during which there will be Project construction-related traffic combined with Other Project construction-related traffic combined with traffic related to a major turnaround, have the traffic measures specified for County maintained intersections been implemented by Chevron in coordination with the City and County? (4.16-11) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.
Miscellaneous	19.1.19	4.16-1, 2a, 4, 7, 11	Has Chevron paid the full costs of modified traffic controls? (4.16-1, 2a, 4, 7, 11) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.20	4.14-1	Has Chevron hired additional security services as necessary for the increase in personnel on-site during construction? (IM 4.14-1) If No, please explain by entering a comment.
Miscellaneous	19.1.23	4.13-2b	Has Chevron communicated on a weekly basis to site management and City management regarding the week's construction plans and schedule? (4.13-2b) If No, please explain by entering a comment.
Miscellaneous	19.1.29	4.9-2	Have stockpiles of soil containing contaminants been kept covered with plastic sheeting? (4.9-2) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.34	4.13-13b	Has Chevron funded the costs of a qualified expert in refinery safety to be selected and retained by County or City to review ISSAs, PHAs, LOPAs and other safety documentation (until such time as funded via RISO)? (4.13-13b) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.35	4.13-13d	Has Chevron submitted quarterly reports to City (and copies to CCHS) on the status of corrective actions taken to implement agency recommendations resulting from August 2012 fire as well as corrective actions taken by Chevron as a result of its own investigation? (4.13-13d) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.36	4.13-13e	Has Chevron funded the City's coordination with CSB, CalOSHA, BAAQMD, and EPA on their investigations? (4.13-13e) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.37	4.3-2a, 2b, 4.8-1	Has Chevron submitted its most current quarterly mitigation measure compliance report demonstrating compliance with the required NOx, ROG, and GHG measures? (4.3-2a, 2b, 4.8-1) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.38	4.8-1l	Has a third-party retained by Chevron quantified and verified the GHG emissions reductions achieved by the specified mitigation measures for construction activities? (4.8-1l) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.39	4.8-1l	Has Chevron submitted an annual report for the most current reporting period verifying GHG emissions reductions from construction activities, reductions achieved through mitigation, and compliance with mitigation requirements? (4.8-1l) If no, please explain by entering a comment. If yes please attach proof.

Miscellaneous	19.1.41	COA G2, H5	Has Chevron submitted annual compliance reports by March 31 of each year (starting after the first full year of construction) to the City regarding the status of any ongoing agency investigations resulting from the August 2012 fire, including EPA, CSB, Cal/OSHA, BAAQMD, and the County, including County safety audit(s) and safety culture audit(s), including a comprehensive list of all findings, corrective actions identified/requested by the agencies, and status of implementation by Chevron of the corrective actions? (COA G2, H5) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.43	COA H5	Has Chevron submitted payment to the County to cover all County costs, staff time, and third party fees and costs associated with any mitigation measure in accordance with a payment scheduled determined by the County? (COA H5)
Miscellaneous	19.1.44	COA H5	Has Chevron submitted payment to the BAAQMD to cover all BAAQMD costs, staff time, and third party fees and costs associated with any mitigation measure in accordance with a payment scheduled determined by the BAAQMD? (COA H5)
Final Certifications	20.1.1		I (Enter name or names in text box to the right) certify that this response and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of those who manage the system or who gather the information, I attest on behalf of Chevron that all information provided in this response is, to the best of my knowledge and belief, true, accurate, and complete.

on Project 3Q2022 Submitted Questionnaire Review

Chevron Response	Chevron Comments	Document Uploaded by Chevron
Yes	Ground disturbing activities did not occur in Q3 2022. Past ground disturbing activities have been reported in previous quarterly construction questionnaires and iEHS reports.	
Yes	Chevron issues an “Instructions to Contractors” (ITC) document (attached) to contractors that specifies the requirements of MM 4.5-1 (see section 2.9 of the ITC). Cultural resources refresher training for contractors was last completed for the construction activity in Q3 2022, and the Refinery plans to complete additional training as needed for future construction-related activities.	4.2.01_ITC Procedure Rev-8 03-28-17.pdf
Yes	Chevron issues an “Instructions to Contractors” (ITC) document (attached to 4.2.01) to contractors that specifies the requirements of MM 4.5-1 (see section 2.9 of the ITC). Cultural resources refresher training for contractors was last completed for the construction activity in Q3 2022, and the Refinery plans to complete additional training as needed for future construction-related activities.	
N/A	No archaeological resources have been discovered to date.	
Yes	Chevron issues an “Instructions to Contractors” (ITC) document (attached to 4.2.01) to contractors that specifies the requirements of MM 4.5-1 (see section 2.9 of the ITC). Cultural resources refresher training for contractors was last completed for the construction activity in Q3 2022, and the Refinery plans to complete additional training as needed for future construction-related activities.	
Yes	No excavation was complete in Q3 2022.	
N/A	No paleontological discoveries have been made to date.	
No		
N/A	No skeletal remains have been discovered to date.	
Yes	As previously reported in the 4Q2018 construction emissions report, construction-related GHG emissions did exceed 10,000 MT CO2e in 2018. In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. Construction for this project commenced on 5/17/2021 and was completed Q1 2022.	
Yes	In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. Construction for this project commenced on 5/17/2021 and was completed Q1 2022.	
Yes	In accordance with COR memo dated 8/31/2018, Chevron has implemented the Wastewater Reuse Project and provided funding in the amount of $2MM in lieu of the FCC PDF and for the delay of the LED lighting (see attached). LED lighting is scheduled for implementation over a 10 year period.	6.1.03_Chevron Check No 0024121959.pdf 6.1.03_COR Memo to file re PDF and Permasense.pdf
Yes	Chevron provided its eighth annual contribution via ACH payment. The City confirmed receipt of payment on June 1, 2022 via email. The CGGRP contribution is included in the funding under the ECIA.	6.1.04_ ECIA Payment 8 Confirmation.msg
Yes	No contaminated soil was generated by Project construction activity in Q3 2022. In previous quarters, the project has generated contaminated soil. Identification, management, storage, and shipment of this contaminated soil is managed by the Refinery’s existing Hazardous Waste Group in accordance with the applicable regulations and best practices, including BMPs WM-3 Stockpile Management, WM-7 Contaminated Soil Management, and CCR Title 22, Division 4.5 Standards for the Management of Hazardous Wastes.	
Yes	Refinery Instructions 505, Excavation Procedures, and 506, Hazardous Waste Management, were included in construction contracts and provide guidance on managing excavations and waste streams. Chevron has issued an “Instructions to Contractors” document to contractors that specifies the requirements of MM 4.13-10a and has reviewed this requirement in the ITC meetings. The Refinery Hazardous Waste Team characterizes and manages soils according to applicable regulations.	
No	No contaminated soils requiring agency notifications have been discovered. See also the response to question 19.1.13.	
N/A		
N/A		

N/A		
No	Nighttime construction-related activities did not occur in Q3 2022.	
N/A	Nighttime construction-related activities did not occur in Q3 2022. Past nighttime construction-related activities were not the type identified in the EIR as those which would potentially exceed noise significance thresholds. Further, Chevron has not received any noise complaints which would trigger additional mitigation obligations.	
N/A		
N/A		
No		
N/A		
N/A		
N/A		
No	CCHS personnel have performed onsite verification and have not retained a third-party expert to-date.	
N/A		
Yes	All required dust control BMPs are being implemented consistently as described in the Instructions to Contractors (ITC) document attached to question 4.2.01.	
Yes	Chevron has implemented Improvement Measure 4.3-3 through the “Instructions to Contractors” (ITC) document. Please see attachment to 4.2.01.	
Yes	Hazardous materials are stored within approved locations as identified within Figure 3-1 of the EIR. Small quantities of consumer products that might be classified as hazardous materials are also stored in OSHA regulated storage cabinets located within construction areas where the City approved construction-related activities are occurring. All construction-related activities are subject to the requirements of the City issued building permits.	
Yes	Chevron has developed a “Waste Diversion Plan/Debris Recovery Plan” (Plan) that identifies acceptable waste storage locations. The Plan was approved by the City of Richmond on May 17, 2016 and is attached to the “Instructions to Contractors” document (see 4.2.01). Acceptable waste storage locations are identified in the Plan as referenced under MM 3.13-3a. Contractors have been trained on the Plan and are responsible for complying with all of its provisions.	
Yes		
Yes		
Have not received invoice	CCHS personnel have performed onsite verification and have not retained a third-party expert to-date.	
Yes	Refinery Instructions 505, Excavation Procedures, and 506, Hazardous Waste Management, were included in construction contracts and provide guidance on managing excavations and waste streams. Chevron has issued an “Instructions to Contractors” (ITC) document to contractors (attached to 4.2.01) that specifies the requirements of MM 4.13-10a (see section 2.0 of the ITC) and has reviewed this requirement in ITC meetings. The Refinery Hazardous Waste Team characterizes and manages any contaminated media.	
Yes	Chevron has held periodic traffic coordination and planning meetings with representatives from the City of Richmond Engineering, Police, and Traffic Departments. The purpose of these meetings has been to plan for implementation of the modified traffic controls. The City has contracted with St. Francis Electrical, which has prepared signal timing modifications and other changes to ensure smooth traffic flow for the Castro/W-580 westbound ramps.	

Yes	Chevron has been in communication with representatives from the City of Richmond Engineering, Police and Traffic Departments. The purpose of the communication has been to discuss adequacy of traffic controls. The City has contracted with St. Francis Electrical, which has prepared signal timing modifications and other changes to ensure smooth traffic flow for the Richmond Parkway/Gertrude Ave. intersection. See attachment.	Chevron Richmond Modernization Project - MM 4 16-11 Traffic Data.msg
Yes	Chevron has held periodic traffic coordination and planning meetings with representatives from the City of Richmond Engineering, Police and Traffic Departments. The purpose of these meetings has been to plan for implementation of the modified traffic controls. The City has contracted with St. Francis Electrical, which has prepared signal timing modifications and other changes to ensure smooth traffic flow for the Castro/Hensley intersection. See also attachment to 19.1.15.	
Yes	As with previous major Refinery turnarounds which occurred after the start of the Modernization Project construction, Chevron is working closely with the City of Richmond Engineering, Police, and Traffic Departments to implement traffic control measures to ensure smooth traffic flow during peak arrival and departure periods. See also attachment to 19.1.15.	
Yes	As with previous major Refinery turnarounds which occurred after the start of the Modernization Project construction, Chevron is working closely with the City of Richmond Engineering, Police, and Traffic Departments to implement traffic control measures to ensure smooth traffic flow during peak arrival and departure periods. See also attachment to 19.1.15.	
Yes	Chevron has paid all invoices to date for St. Francis Electrical, the City of Richmond's traffic management contractor, and is set to pay all future traffic costs.	
Yes		
Yes	Refinery site management took ownership of the Modernization Project construction following commencement of Project operations. Chevron's permitting teams are in regular contact with the City's building inspection department concerning ongoing permitting and construction-related activities.	
Yes	Chevron has issued an "Instructions to Contractors" (ITC) document to contractors that specifies the requirements of MM 4.9-2 (see section 2.0 of the ITC) including Best Management Practices. Please see attachment to 4.2.01. The Chevron Modernization Compliance Team verifies compliance with these requirements.	
Yes	The County has selected the qualified expert. Chevron will pay invoices for this expert upon receipt. See attachment to 19.1.43.	
Yes	The twenty-fourth quarterly 4.13-13d report is attached. The 24th submittal is the final report prepared under the quarterly reporting requirement. All corrective actions taken to implement agency recommendations and as a result of Chevron's internal investigation have been implemented and, where required, integrated into Chevron's maintenance and operating procedures.	Transmittal 1_24 MM4_13-13d Quarterly Report .msg
No	Chevron has not been invoiced for, nor notified of, the City's coordination with CSB, CalOSHA, BAAQMD, and EPA on their investigations.	
Yes	See Transmittal #19.23 attached.	Refinery Modernization Project - Transmittal #19_23 Construction Emissions Report_ Third Quarter 2022.msg
No	Chevron has worked with the City's independent environmental consultant, Ramboll, to develop a construction emissions tracking tool that takes into account quantifiable reductions. Please see question 19.1.37 for an update concerning current construction emissions.	
Yes	Please see question 19.1.37 for an update concerning current construction emissions.	

Yes	At the June 6, 2019 Planning Commission Hearing, the City approved submittal of subsequent annual reports by September 1 starting in 2020 to align with Report inputs from other regulatory agency submittals. The City subsequently extended the due date until September 8 for report year 2019. Chevron submitted the annual compliance report for report year 2019 on September 4, 2020, for report year 2020 on August 31, 2021 and for report year 2021 on September 1, 2022. See attached transmittal for the 2021RY.	Transmittal #25 CUP H5 Annual Compliance Report.msg
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Third Party Compliance Audit	16.1.1	4.13-13c	Has the City or CCHS retained a third-party expert to audit compliance at the facility? (4.13-13c)
Third Party Compliance Audit	16.1.2	4.13-13c	If Yes, Has Chevron reimbursed the City or CCHS for these fees/expenses? (4.13-13c)
Miscellaneous	19.1.5	4.3-1	Are all required dust control BMPs being implemented consistently? (4.3-1) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.6	IM 4.3-3	Has Chevron implemented the required PM emissions reduction practices for construction activities? (IM 4.3-3) If no, please explain by entering a comment.
Miscellaneous	19.1.7	4.13-2a	Have hazardous materials been stored only in City-approved locations? (4.13-2a) If no, please explain by entering a comment.
Miscellaneous	19.1.8	4.13-3a	Has hazardous waste been stored only in locations approved by the City? (4.13-3a) If no, please explain by entering a comment.
Miscellaneous	19.1.9	4.13-3b	Has all hazardous waste been transported off-site to an authorized facility by a licensed transporter within 90 days after the wastes were generated? (4.13-3b) If no, please explain by entering a comment.
Miscellaneous	19.1.10	4.13-3c	Has all non-hazardous waste been transported off-site to an authorized facility by a licensed transporter within 180 days after the wastes were generated? (4.13-3c) If no, please explain by entering a comment.
Miscellaneous	19.1.12	4.13-7d	Has Chevron reimbursed the City for any 3rd party experts retained by the City or CCHS to review PHAs, ISSAs, or LOPAs? (4.13-7d)
Miscellaneous	19.1.13	4.13-10a	Has Chevron trained construction workers in recognizing contamination and characterizing/managing any contaminated media? (4.13-10a) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.14	4.16-1, 3, 6	Has Chevron coordinated with the City and CalTrans to implement modified traffic controls at peak PM hours per the specified methods for the Castro/W-180 westbound ramps? (4.16-1, 3, 6) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.

Miscellaneous	19.1.15	4.16-2, 5, 9	Has Chevron coordinated with the City and CalTrans to implement modified traffic controls at peak PM hours per the specified methods for Richmond Parkway/Gertrude Ave? (4.16-2, 5, 9) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.
Miscellaneous	19.1.16	4.16-4, 8	For periods during which there is/will be both Project construction-related traffic combined with Other Project construction-related traffic, has Chevron coordinated with the City and CalTrans to implement modified traffic controls at peak PM hours per the specified methods for Castro/Hensley? (4.16-4, 8) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.
Miscellaneous	19.1.17	4.16-7	For periods during which there is/will be Project construction-related traffic combined with Other Project construction-related traffic combined with traffic related to a major turnaround, have the traffic measures specified for Castro Street/General Chemical Access been implemented? (4.16-7) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.18	4.16-11	For periods during which there will be Project construction-related traffic combined with Other Project construction-related traffic combined with traffic related to a major turnaround, have the traffic measures specified for County maintained intersections been implemented by Chevron in coordination with the City and County? (4.16-11) If No, please explain by entering a comment. If Yes, please enter a comment summarizing coordination.
Miscellaneous	19.1.19	4.16-1, 2a, 4, 7, 11	Has Chevron paid the full costs of modified traffic controls? (4.16-1, 2a, 4, 7, 11) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.20	4.14-1	Has Chevron hired additional security services as necessary for the increase in personnel on-site during construction? (IM 4.14-1) If No, please explain by entering a comment.
Miscellaneous	19.1.23	4.13-2b	Has Chevron communicated on a weekly basis to site management and City management regarding the week's construction plans and schedule? (4.13-2b) If No, please explain by entering a comment.
Miscellaneous	19.1.29	4.9-2	Have stockpiles of soil containing contaminants been kept covered with plastic sheeting? (4.9-2) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.34	4.13-13b	Has Chevron funded the costs of a qualified expert in refinery safety to be selected and retained by County or City to review ISSAs, PHAs, LOPAs and other safety documentation (until such time as funded via RISO)? (4.13-13b) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.35	4.13-13d	Has Chevron submitted quarterly reports to City (and copies to CCHS) on the status of corrective actions taken to implement agency recommendations resulting from August 2012 fire as well as corrective actions taken by Chevron as a result of its own investigation? (4.13-13d) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.36	4.13-13e	Has Chevron funded the City's coordination with CSB, CalOSHA, BAAQMD, and EPA on their investigations? (4.13-13e) If no, please explain by entering a comment. If yes, please attach proof.
Miscellaneous	19.1.37	4.3-2a, 2b, 4.8-1	Has Chevron submitted its most current quarterly mitigation measure compliance report demonstrating compliance with the required NOx, ROG, and GHG measures? (4.3-2a, 2b, 4.8-1) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.38	4.8-1l	Has a third-party retained by Chevron quantified and verified the GHG emissions reductions achieved by the specified mitigation measures for construction activities? (4.8-1l) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.39	4.8-1l	Has Chevron submitted an annual report for the most current reporting period verifying GHG emissions reductions from construction activities, reductions achieved through mitigation, and compliance with mitigation requirements? (4.8-1l) If no, please explain by entering a comment. If yes please attach proof.

Miscellaneous	19.1.41	COA G2, H5	Has Chevron submitted annual compliance reports by March 31 of each year (starting after the first full year of construction) to the City regarding the status of any ongoing agency investigations resulting from the August 2012 fire, including EPA, CSB, Cal/OSHA, BAAQMD, and the County, including County safety audit(s) and safety culture audit(s), including a comprehensive list of all findings, corrective actions identified/requested by the agencies, and status of implementation by Chevron of the corrective actions? (COA G2, H5) If no, please explain by entering a comment. If yes please attach proof.
Miscellaneous	19.1.43	COA H5	Has Chevron submitted payment to the County to cover all County costs, staff time, and third party fees and costs associated with any mitigation measure in accordance with a payment scheduled determined by the County? (COA H5)
Miscellaneous	19.1.44	COA H5	Has Chevron submitted payment to the BAAQMD to cover all BAAQMD costs, staff time, and third party fees and costs associated with any mitigation measure in accordance with a payment scheduled determined by the BAAQMD? (COA H5)
Final Certifications	20.1.1		I (Enter name or names in text box to the right) certify that this response and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of those who manage the system or who gather the information, I attest on behalf of Chevron that all information provided in this response is, to the best of my knowledge and belief, true, accurate, and complete.

on Project 4Q2022 Submitted Questionnaire Review

Chevron Response	Chevron Comments	Document Uploaded by Chevron
No	Ground disturbing activities did not occur in Q4 2022. Past ground disturbing activities have been reported in previous quarterly construction questionnaires and iEHS reports.	
Yes	Chevron issues an “Instructions to Contractors” (ITC) document (attached) to contractors that specifies the requirements of MM 4.5-1 (see section 2.9 of the ITC). Cultural resources refresher training for contractors was last completed for the construction activity in Q4 2022, and the Refinery plans to complete additional training as needed for future construction-related activities.	4.2.01_ITC Procedure Rev-8 03-28-17.pdf
Yes	Chevron issues an “Instructions to Contractors” (ITC) document (attached to 4.2.01) to contractors that specifies the requirements of MM 4.5-1 (see section 2.9 of the ITC). Cultural resources refresher training for contractors was last completed for the construction activity in Q4 2022, and the Refinery plans to complete additional training as needed for future construction-related activities.	
N/A	No archaeological resources have been discovered to date.	
Yes	Chevron issues an “Instructions to Contractors” (ITC) document (attached to 4.2.01) to contractors that specifies the requirements of MM 4.5-1 (see section 2.9 of the ITC). Cultural resources refresher training for contractors was last completed for the construction activity in Q4 2022, and the Refinery plans to complete additional training as needed for future construction-related activities.	
Yes	No excavation was complete in Q4 2022.	
N/A	No paleontological discoveries have been made to date.	
No		
N/A	No skeletal remains have been discovered to date.	
Yes	As previously reported in the 4Q2018 construction emissions report, construction-related GHG emissions did exceed 10,000 MT CO2e in 2018. In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. Construction for this project commenced on 5/17/2021 and was completed Q1 2022.	
Yes	In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. Construction for this project commenced on 5/17/2021 and was completed Q1 2022.	
Yes	In accordance with COR memo dated 8/31/2018, Chevron has implemented the Wastewater Reuse Project and provided funding in the amount of $2MM in lieu of the FCC PDF and for the delay of the LED lighting (see attached). LED lighting is scheduled for implementation over a 10 year period.	6.1.03_Chevron Check No 0024121959.pdf 6.1.03_COR Memo to file re PDF and Permasense.pdf
Yes	Chevron provided its eighth annual contribution via ACH payment. The City confirmed receipt of payment on June 1, 2022 via email. The CGGRP contribution is included in the funding under the ECIA.	6.1.04_ ECIA Payment 8 Confirmation.msg
Yes	No contaminated soil was generated by Project construction activity in Q4 2022. In previous quarters, the project has generated contaminated soil. Identification, management, storage, and shipment of this contaminated soil is managed by the Refinery’s existing Hazardous Waste Group in accordance with the applicable regulations and best practices, including BMPs WM-3 Stockpile Management, WM-7 Contaminated Soil Management, and CCR Title 22, Division 4.5 Standards for the Management of Hazardous Wastes.	
Yes	Refinery Instructions 505, Excavation Procedures, and 506, Hazardous Waste Management, were included in construction contracts and provide guidance on managing excavations and waste streams. Chevron has issued an “Instructions to Contractors” document to contractors that specifies the requirements of MM 4.13-10a and has reviewed this requirement in the ITC meetings. The Refinery Hazardous Waste Team characterizes and manages soils according to applicable regulations.	
No	No contaminated soils requiring agency notifications have been discovered. See also the response to question 19.1.13.	
N/A		
N/A		

N/A		
No	Nighttime construction-related activities did not occur in Q42022.	
N/A	Nighttime construction-related activities did not occur in Q4 2022. Past nighttime construction-related activities were not the type identified in the EIR as those which would potentially exceed noise significance thresholds. Further, Chevron has not received any noise complaints which would trigger additional mitigation obligations.	
N/A		
N/A		
No		
N/A		
N/A		
N/A		
N/A		
No	CCHS personnel have performed onsite verification and have not retained a third-party expert to-date.	
N/A		
Yes	All required dust control BMPs are being implemented consistently as described in the Instructions to Contractors (ITC) document attached to question 4.2.01.	
Yes	Chevron has implemented Improvement Measure 4.3-3 through the “Instructions to Contractors” (ITC) document. Please see attachment to 4.2.01.	
Yes	Hazardous materials are stored within approved locations as identified within Figure 3-1 of the EIR. Small quantities of consumer products that might be classified as hazardous materials are also stored in OSHA regulated storage cabinets located within construction areas where the City approved construction-related activities are occurring. All construction-related activities are subject to the requirements of the City issued building permits.	
Yes	Chevron has developed a “Waste Diversion Plan/Debris Recovery Plan” (Plan) that identifies acceptable waste storage locations. The Plan was approved by the City of Richmond on May 17, 2016 and is attached to the “Instructions to Contractors” document (see 4.2.01). Acceptable waste storage locations are identified in the Plan as referenced under MM 3.13-3a. Contractors have been trained on the Plan and are responsible for complying with all of its provisions.	
Yes		
Yes		
Have not received invoice	CCHS personnel have performed onsite verification and have not retained a third-party expert to-date.	
Yes	Refinery Instructions 505, Excavation Procedures, and 506, Hazardous Waste Management, were included in construction contracts and provide guidance on managing excavations and waste streams. Chevron has issued an “Instructions to Contractors” (ITC) document to contractors (attached to 4.2.01) that specifies the requirements of MM 4.13-10a (see section 2.0 of the ITC) and has reviewed this requirement in ITC meetings. The Refinery Hazardous Waste Team characterizes and manages any contaminated media.	
Yes	Chevron has held periodic traffic coordination and planning meetings with representatives from the City of Richmond Engineering, Police, and Traffic Departments. The purpose of these meetings has been to plan for implementation of the modified traffic controls. The City has contracted with St. Francis Electrical, which has prepared signal timing modifications and other changes to ensure smooth traffic flow for the Castro/W-580 westbound ramps.	

Yes	Chevron has been in communication with representatives from the City of Richmond Engineering, Police and Traffic Departments. The purpose of the communication has been to discuss adequacy of traffic controls. The City has contracted with St. Francis Electrical, which has prepared signal timing modifications and other changes to ensure smooth traffic flow for the Richmond Parkway/Gertrude Ave. intersection. See attachment.	Chevron Richmond Modernization Project - MM 4 16-11 Traffic Data.msg
Yes	Chevron has held periodic traffic coordination and planning meetings with representatives from the City of Richmond Engineering, Police and Traffic Departments. The purpose of these meetings has been to plan for implementation of the modified traffic controls. The City has contracted with St. Francis Electrical, which has prepared signal timing modifications and other changes to ensure smooth traffic flow for the Castro/Hensley intersection. See also attachment to 19.1.15.	
Yes	As with previous major Refinery turnarounds which occurred after the start of the Modernization Project construction, Chevron is working closely with the City of Richmond Engineering, Police, and Traffic Departments to implement traffic control measures to ensure smooth traffic flow during peak arrival and departure periods. See also attachment to 19.1.15.	
Yes	As with previous major Refinery turnarounds which occurred after the start of the Modernization Project construction, Chevron is working closely with the City of Richmond Engineering, Police, and Traffic Departments to implement traffic control measures to ensure smooth traffic flow during peak arrival and departure periods. See also attachment to 19.1.15.	
Yes	Chevron has paid all invoices to date for St. Francis Electrical, the City of Richmond's traffic management contractor, and is set to pay all future traffic costs.	
Yes		
Yes	Refinery site management took ownership of the Modernization Project construction following commencement of Project operations. Chevron's permitting teams are in regular contact with the City's building inspection department concerning ongoing permitting and construction-related activities.	
Yes	Chevron has issued an "Instructions to Contractors" (ITC) document to contractors that specifies the requirements of MM 4.9-2 (see section 2.0 of the ITC) including Best Management Practices. Please see attachment to 4.2.01. The Chevron Modernization Compliance Team verifies compliance with these requirements.	
Yes	The County has selected the qualified expert. Chevron will pay invoices for this expert upon receipt. See attachment to 19.1.43.	
Yes	The twenty-fourth quarterly 4.13-13d report is attached. The 24th submittal is the final report prepared under the quarterly reporting requirement. All corrective actions taken to implement agency recommendations and as a result of Chevron's internal investigation have been implemented and, where required, integrated into Chevron's maintenance and operating procedures.	Transmittal 1_24 MM4_13-13d Quarterly Report .msg
No	Chevron has not been invoiced for, nor notified of, the City's coordination with CSB, CalOSHA, BAAQMD, and EPA on their investigations.	
Yes	See Transmittal #19.24 attached.	Refinery Modernization Project - Transmittal #19_24 Construction Emissions Report_ Fourth Quarter 2022.msg
No	Chevron has worked with the City's independent environmental consultant, Ramboll, to develop a construction emissions tracking tool that takes into account quantifiable reductions. Please see question 19.1.37 for an update concerning current construction emissions.	
Yes	Please see question 19.1.37 for an update concerning current construction emissions.	

Yes	At the June 6, 2019 Planning Commission Hearing, the City approved submittal of subsequent annual reports by September 1 starting in 2020 to align with Report inputs from other regulatory agency submittals. The City subsequently extended the due date until September 8 for report year 2019. Chevron submitted the annual compliance report for report year 2019 on September 4, 2020, for report year 2020 on August 31, 2021 and for report year 2021 on September 1, 2022. See attached transmittal for the 2021RY.	Transmittal #25 CUP H5 Annual Compliance Report.msg
Yes	Chevron has paid all invoices received from the County as of the date of report submittal.	
Have not received invoice		
Danny Barbour for Shawn Lee		

ATTACHMENT 4
Quarterly Crude Fire Corrective Action Status Reports

The final quarterly crude fire corrective action status report was submitted on March 31, 2021. See 2022 Compliance Report.

ATTACHMENT 5
Quarterly Construction Emissions Reports
Operational Year 2022

CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
Construction Emissions Report
First Quarter 2022
April 28, 2022

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

Pursuant to the Chevron Richmond Refinery Modernization Project (Project) Mitigation Monitoring and Reporting Program (MMRP), Chevron is required to provide quarterly compliance reports for emissions of NO_x (mitigation measure (MM) 4.3-2a), ROG (MM 4.3-2b), and greenhouse gases (GHG) (MM 4.8-1) during Project construction. This is the Construction Emissions Report for construction activity that occurred through the first quarter 2022 (1Q2022).[1]

Chevron tracks construction emissions using the Construction Emissions Module (Module) developed in conjunction with the City of Richmond's environmental consultant, Ramboll Environ, Inc. (Ramboll). The Module calculates emissions from On-Road Onsite Only vehicle use, On-Road Onsite and Offsite vehicle use, Off-Road Equipment, and Architectural Coating and Paving activities. The latest update to the Module, version 7.0, was issued to Chevron on January 23, 2017 with an additional revision to version 7.0 in 1Q2019 to include years 2019 through 2023 for data entry. Data from the Module is available for review at the Refinery.

In 1Q2022, Chevron continued to undertake secondary construction activities required under the CUP and MMRP. Construction activities related to the doming of T-3189 and the GHG Construction Mitigation Project commenced in 2021 and were completed in 1Q2022. Project components still to be completed include demolition and dismantling of the existing Hydrogen Plant. Chevron will continue to track construction-related emissions accordingly.

As explained further below, based on current data and projections, Chevron anticipates that emissions of NO_x and ROG will be significantly lower than projected in the EIR. As secondary construction work is still underway, Chevron does not have enough data to predict whether the average daily emissions of NO_x and ROG will exceed the thresholds of significance once Project construction is complete.[2] Therefore, the Project is implementing MM 4.3-2a and MM 4.3-2b, as described below. For GHG emissions, Chevron is implementing MM 4.8-1a – 4.8-1k, as described below. In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. This project commenced construction on May 17, 2021 and completed in 1Q2022.

Construction Emissions Summary

Several factors are contributing to actual emissions from Project construction being lower than projected in the EIR.

First, when estimating construction emissions from the Project, the EIR conservatively assumed that all Project components would be constructed during a two-year construction period. (Draft EIR, p. 3-39; see also Table 3-2.) Chevron has elected to defer construction of the FCC FHT improvements (Draft EIR, p. 3-25) and improvements to one of the sulfur recovery units (SRU), resulting in less intensive construction during the initial construction period than was estimated in the EIR.[3] Further, the construction for the remaining Project components extended over a three

[1] Pursuant to Impact 4.3-3 of the Environmental Impact Report (EIR) prepared for the Project, emissions of PM_{10} and $PM_{2.5}$ from construction activities are less than significant without mitigation, though the EIR includes Improvement Measure 4.3-3 requiring certain best practices to be implemented. Further, the EIR did not analyze or require tracking or mitigation of CO during construction activities. However, Chevron uses the Construction Emissions Module to track PM_{10}, $PM_{2.5}$, and CO emissions, and maintains this data at the Refinery.

[2] For purposes of assessing potential impacts from the Project's construction-related emissions, the EIR utilized the California Environmental Air Quality Act Air Quality Guidelines promulgated by the Bay Area Air Quality Management District (BAAQMD CEQA Guidelines).[3] Pursuant to Condition A7 of the Condition Use Permit (CUP), Chevron has ten (10) years in which to complete construction of the Project, with one automatic, two-year extension. Chevron has not yet determined when it might pursue construction of the remaining Project components.

[3] Pursuant to Condition A7 of the Condition Use Permit (CUP), Chevron has ten (10) years in which to complete construction of the Project, with one automatic, two-year extension. Chevron has not yet determined when it might pursue construction of the remaining Project components.

year period approximately.[4] Project components still to be completed include demolition and dismantling of the existing Hydrogen Plant, which will further extend the Project construction period. This means the total number of days during the construction period by which total emissions of NOx and ROG will be divided to determine the respective average daily emissions will be greater than used in the EIR.

Further, because the EIR did not have specific data concerning the fleet to be used during construction, it made a conservative assumption that the majority of engines were Tier 2 and Tier 3. In the case of off-road equipment, emissions from equipment with higher tier engines (i.e., of equal horsepower) are generally less than emissions from equipment with lower tier engines[5]. Higher tier engines are associated with a lower emission factor, resulting in lower emissions when compared to emissions from lower tier engines. To date, actual data shows that ~89% of engines in the cumulative fleet since the beginning of project construction are Tier 4 Interim or Tier 4 Final.[6] Of the remaining ~11% of the engines, 9.4% are Tier 3, and 1.7% are Tier 2, with a negligible quantity of Tier 1 engines in the fleet (i.e., below 1%). Therefore, the Project's use of Tier 4 Interim and Tier 4 Final engines, where possible, has contributed to actual Project construction emissions that are lower than the emissions projected in the EIR.[7]

Ozone Precursors

Pursuant to the BAAQMD CEQA Guidelines, the potential significance of construction-related emissions of NO_x and ROG is assessed by comparing the total average daily emissions from the Project to the threshold of significance. In order to calculate total average daily emissions, total Project construction-related emissions will be divided by the total number of days during the construction period. The total daily average is then compared to the threshold of significance. Based on current data from the Module, as well as Chevron's projected construction schedule and levels of activity, Chevron believes that emissions of NO_x and ROG will be significantly lower than those projected in the EIR. Nevertheless, since several Project components remain to be completed, it is impossible to predict with certainty whether total emissions of NO_x and ROG over the life of construction will result in the Project exceeding the thresholds of significance. Chevron is therefore implementing MM 4.3-2a and MM 4.3-2b, as follows:

MM 4.3-2a Implementation	
MM 4.3-2a Part(s)	Implementation Status
Chevron shall reduce construction-related NO_x emissions to less-than-significant levels by implementing one or more of the following feasible mitigation measures, all of which have been found to result in emissions reduction for construction projects:	
• Using lower emitting construction equipment, increasing carpooling or otherwise reducing construction-worker automobile use in daily commutes, extending the duration of construction by 1 year by delaying the modifications required to increase the throughput capacity of the FCC	• As described above, ~89% of the engines in the cumulative construction fleet since the beginning of project construction are Tier 4 Interim or Tier 4 Final, compared to the EIR, which assumed the majority of the fleet would have engines in Tiers 2 and 3.

[4] The SRU improvements are the final Project component scheduled to be constructed during the initial construction period, and Chevron completed construction of these improvements in 2019.
[5] Source: CalEEMod User Guide. OFFROAD Emission Factor Based on Engine Tier. http://caleemod.com/
[6] The calculation for percentage of equipment associated with each engine tier is based on actual weekly contractor equipment counts received from May 9, 2016 through April 3, 2022.
[7] This likelihood was recognized in the EIR, Appendix 4.3-CST, p. 6, n. 2: "Chevron Data Transmittal #36O (Rev#3), 2014 provides equipment data for eight consecutive quarters. Because the exact start date of future construction is uncertain, the emissions analysis conservatively uses emission factors for 2014 for the first four quarters of construction, and 2015 emission factors for the last four quarters of construction. A construction start date later than January 2014 would lead to lower emissions that than predicted here as the emissions profile of the construction fleet is cleaner, due to the implementation of regulations requiring lower emissions engines."

MM 4.3-2a Implementation	
FHT until after construction of the hydrogen plant and amine contractor, or reducing the hours of use of construction equipment;	• Chevron has extended the initial construction period from two years.
• Reducing operations and/or emissions from portable generators at the Facility during the construction period, and thereby reducing NO_x emissions;	• The number of portable diesel generators used during construction has been reduced by, for example, utilizing solar-powered light standards for certain work areas. Approximately 2% of the cumulative hours for light plants since the beginning of project construction are attributed to light plants operating on solar power.
• Installing the low-NO_x burners included in the Modernization Project in the first 6 months of the construction period, thereby reducing net NO_x emissions from the Facility while construction of the Modernization Project continues;	• Chevron elected not to pursue this option as it does not believe it will be necessary to mitigate NO_x emissions to less-than-significant.
• Retiring permanent NO_x emission reduction credits to offset this temporary NO_x construction increase, in an amount sufficient to offset construction period NO_x emissions; or	• Chevron is prepared to retire NO_x emissions reduction credits as necessary to mitigate NO_x emissions.
• Implementing a combination of two or more of the above measures in an amount sufficient to offset construction-period NO_x emissions to less-than-significant levels.	• See above.

MM 4.3-2b Implementation	
MM 4.3-2b Part(s)	Implementation Status
Chevron shall reduce construction-related ROG emissions to less-than-significant levels by implementing one or more of the following feasible mitigation measures, all of which have been found to result in emissions reduction for construction projects:	
• Installing the tank dome Project Design Feature, and installing one additional tank dome, in the first 6 months of Project construction, thereby reducing net ROG emissions from the Facility before completing construction of the hydrogen plant or sulfur removal components of the Modernization Project;	• Chevron elected not to pursue the additional tank dome as it does not believe it will be necessary to mitigate ROG emissions to less-than-significant.
• Using lower emitting construction equipment, increasing carpooling or otherwise reducing construction-worker automobile use in daily commutes, extending the duration of construction by 1 year by delaying the modifications required to increase the throughput capacity of the FCC FHT until after construction of the hydrogen plant and amine contactor, or reducing the hours of use of construction equipment;	• As described above, ~89% of the engines in the cumulative construction fleet since the beginning of project construction are Tier 4 Interim or Tier 4 Final, compared to the EIR, which assumed the majority of the fleet would have engines in Tiers 2 and 3. • Chevron has extended the construction period from two years.
• Retiring permanent ROG emission reduction credits to offset this temporary ROG construction increase, in an amount sufficient to offset construction-period ROG emissions; or	• Chevron is prepared to retire ROG emissions reduction credits as necessary to mitigate ROG emissions to less-than-significant.

MM 4.3-2b Implementation	
• Implementing a combination of the above measures, in an amount sufficient to offset construction-period ROG emissions to less-than-significant levels.	• See above.

Details concerning implementation of the above-measures can be found in Chevron's 2018 Annual Compliance Report, submitted to the City on March 31, 2019 and accepted by the City's Planning Commission on June 6, 2019. Chevron submitted its 2019 Annual Compliance Report to the City on September 4, 2020 and its 2020 Annual Compliance Report to the City on August 31, 2021.

GHG

Pursuant to the BAAQMD CEQA Guidelines, the potential significance of construction-related emissions of GHG is assessed by comparing total annual emissions of GHG to the threshold of significance (10,000 MT CO_2e per year). Table 4Q2021-GHG shows total construction-related GHG emissions for years 2016 through 2021 4Q not including reductions associated with implementation of MM 4.8-1a – 4.8-1k. Because GHGs are tracked on an annual basis, the cumulative total for construction related GHG emissions resets to zero at the beginning of each calendar year.

Table 4Q2021– GHG Emissions from Construction

Year	Cumulative Total (in MT CO2e/yr)	BAAQMD Threshold of Significance (in MT CO2e/yr)
2016[1]	1,195.8	10,000
2017	7,638.1	10,000
2018[2]	11,959.0	10,000
2019[3]	2,196.0	10,000
2020[4]	2.5	10,000
2021[5]	97.2	10,000
2022[6]	0.5	10,000

[1] Based on data collected beginning May 9, 2016 and ending December 31, 2016
[2] For data collected through December 30, 2018.
[3] Based on data collected through December 30, 2019. This value also includes the GHG emissions calculated by the Construction Emissions Module for the week of December 31,2018 through January 6, 2019, as the majority of work days for that week occurred in 2019.
[4] For data collected through January 3, 2021.
[5] For data collected through January 2, 2022.
[6] For data collected through April 3, 2022.

Since commencement of Project construction in 2016, the total construction-related GHG emissions have not exceeded the annual threshold of significance, with the exception of calendar year 2018. The Project exceeded the annual threshold for GHG emissions in 2018 due to construction intensity. In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-11 and worked with the City to finalize details and gain concurrence from the City. Construction of this project commenced construction on May 17, 2021 and completed in 1Q2022. Additionally, Chevron is implementing MM 4.8-1a – 4.8-1k, as described below.

MM 4.8-1 Implementation	
MM 4.8.1 Part(s)	Implementation Status[1]
Consistent with air quality mitigation measures for construction activities, Chevron would be required to	

MM 4.8-1 Implementation	
implement the following mitigation measures to reduce its Project construction emissions. Implementation of the mitigation measures would result in further reductions in greenhouse gas emissions.	
a. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.	• Done
b. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxic Control Measure (Title 13 of California Code of Regulations [CCR], Section 2485). Clear signage shall be provided for construction workers at all access points.	• Done
c. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.	• Done
d. The idling time of diesel-powered construction equipment shall be limited to 2 minutes.	• Done
e. The Project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in construction (i.e., owned, leased, and subcontractor vehicles) would achieve a Project-wide fleet-average 20% nitrogen oxide reduction and 45% particulate matter reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions include the use of late model engines, Low-emission diesel products, Alternative fuels, Engine retrofit technology, After-treatment products, Add-on devices such as particular filters, and/or Other options as such become available. (Several of these measures would also reduce greenhouse gas emissions.)	• Done
f. All contractors shall be required to use equipment that meets CARB's most recent certification standard for off-road heavy-duty diesel engines.	• Done
g. Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).	• Done
h. Enforce and follow limits on idling time for commercial vehicles, including delivery and construction vehicles.	• Done
i. Using alternative fueled (e.g., biodiesel, electric) construction vehicles/equipment on at least 15% of the fleet.	• Done
j. Using local building materials of at least 10%.	• Done
k. Recycling or reusing at least 50% of construction waste or demolition materials.	• Done
l. For each year of Project construction, Chevron shall hire, at commercially reasonable rates and at Chevron's expense, a qualified third-party entity	• Chevron is implementing MM 4.8-1a – 4.8-1k. Chevron worked with the City to finalize details regarding Chevron's proposed project to mitigate 2018

MM 4.8-1 Implementation	
reasonably acceptable to the City to quantify and verify in writing whether the reductions achieved from the above-described construction greenhouse gas mitigation measures for that year of Project construction adequately mitigated this potentially significant impact, which report shall be subject to City's reasonably approval. For any year of construction for which construction-related diesel emissions are not reduced to or below the 10,000-MT CO_2e per year significance threshold, Chevron shall implement one or more of the following measures in an amount sufficient to reduce construction period greenhouse gas emissions to less-than-significant levels: (i) Reduce diesel emissions from other equipment at the Facility, such as a diesel-powered generator, in an amount equal to the construction-related greenhouse gas emissions in excess of 10,000 MT CO_2e per year for any calendar year of Project construction, which reduced emission level Chevron shall maintain for the following two years. (ii) Permanently retire, or retrofit from diesel to electric power, one or more Facility sources that emit more than 300 MT CO_2e per year.	construction-related GHG emissions consistent with MM 4.8-1l. Project construction completed in 1Q2022.

Details concerning implementation of the above measures can be found in Chevron's 2018 Annual Compliance Report, submitted to the City on March 31, 2019 and accepted by the City's Planning Commission on June 6, 2019. Chevron submitted its 2019 Annual Compliance Report to the City on September 4, 2020 and its 2020 Annual Compliance Report to the City on August 31, 2021.

CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
Construction Emissions Report
Second Quarter 2022
July 29, 2022

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

Pursuant to the Chevron Richmond Refinery Modernization Project (Project) Mitigation Monitoring and Reporting Program (MMRP), Chevron is required to provide quarterly compliance reports for emissions of NO_x (mitigation measure (MM) 4.3-2a), ROG (MM 4.3-2b), and greenhouse gases (GHG) (MM 4.8-1) during Project construction. This is the Construction Emissions Report for construction activity that occurred through the second quarter 2022 (2Q2022).[1]

Chevron tracks construction emissions using the Construction Emissions Module (Module) developed in conjunction with the City of Richmond's environmental consultant, Ramboll Environ, Inc. (Ramboll). The Module calculates emissions from On-Road Onsite Only vehicle use, On-Road Onsite and Offsite vehicle use, Off-Road Equipment, and Architectural Coating and Paving activities. The latest update to the Module, version 7.0, was issued to Chevron on January 23, 2017 with an additional revision to version 7.0 in 1Q2019 to include years 2019 through 2023 for data entry. Data from the Module is available for review at the Refinery.

Construction activities related to the doming of T-3189 and the GHG Construction Mitigation Project were completed in 1Q2022. In 2Q2022, no Project construction occurred, and, as such there are no significant updates to Project construction emissions for second quarter. However, Chevron began planning and prework for demolition and dismantling of the existing Hydrogen Plant required under the CUP and MMRP. Chevron will continue to track construction-related emissions accordingly.

As explained further below, based on current data and projections, Chevron anticipates that emissions of NO_x and ROG will be significantly lower than projected in the EIR. As secondary construction work is still underway, Chevron does not have enough data to predict whether the average daily emissions of NO_x and ROG will exceed the thresholds of significance once Project construction is complete.[2] Therefore, the Project is implementing MM 4.3-2a and MM 4.3-2b, as described below. For GHG emissions, Chevron is implementing MM 4.8-1a – 4.8-1k, as described below. In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. This project commenced construction in 2Q2021 and completed in 1Q2022.

Construction Emissions Summary

Several factors are contributing to actual emissions from Project construction being lower than projected in the EIR.

First, when estimating construction emissions from the Project, the EIR conservatively assumed that all Project components would be constructed during a two-year construction period. (Draft EIR, p. 3-39; see also Table 3-2.) Chevron has elected to defer construction of the FCC FHT improvements (Draft EIR, p. 3-25) and improvements to one of the sulfur recovery units (SRU), resulting in less intensive construction during the initial construction period

[1] Pursuant to Impact 4.3-3 of the Environmental Impact Report (EIR) prepared for the Project, emissions of PM_{10} and $PM_{2.5}$ from construction activities are less than significant without mitigation, though the EIR includes Improvement Measure 4.3-3 requiring certain best practices to be implemented. Further, the EIR did not analyze or require tracking or mitigation of CO during construction activities. However, Chevron uses the Construction Emissions Module to track PM_{10}, $PM_{2.5}$, and CO emissions, and maintains this data at the Refinery.

[2] For purposes of assessing potential impacts from the Project's construction-related emissions, the EIR utilized the California Environmental Air Quality Act Air Quality Guidelines promulgated by the Bay Area Air Quality Management District (BAAQMD CEQA Guidelines).[3] Pursuant to Condition A7 of the Condition Use Permit (CUP), Chevron has ten (10) years in which to complete construction of the Project, with one automatic, two-year extension. Chevron has not yet determined when it might pursue construction of the remaining Project components.

than was estimated in the EIR.[3] Further, the construction for the remaining Project components extended over a three year period approximately.[4] Project components still to be completed include demolition and dismantling of the existing Hydrogen Plant, which will further extend the Project construction period. This means the total number of days during the construction period by which total emissions of NOx and ROG will be divided to determine the respective average daily emissions will be greater than used in the EIR.

Further, because the EIR did not have specific data concerning the fleet to be used during construction, it made a conservative assumption that the majority of engines were Tier 2 and Tier 3. In the case of off-road equipment, emissions from equipment with higher tier engines (i.e., of equal horsepower) are generally less than emissions from equipment with lower tier engines[5]. Higher tier engines are associated with a lower emission factor, resulting in lower emissions when compared to emissions from lower tier engines. To date, actual data shows that ~89% of engines in the cumulative fleet since the beginning of project construction are Tier 4 Interim or Tier 4 Final.[6] Of the remaining ~11% of the engines, 9.4% are Tier 3, and 1.7% are Tier 2, with a negligible quantity of Tier 1 engines in the fleet (i.e., below 1%). Therefore, the Project's use of Tier 4 Interim and Tier 4 Final engines, where possible, has contributed to actual Project construction emissions that are lower than the emissions projected in the EIR.[7]

Ozone Precursors

Pursuant to the BAAQMD CEQA Guidelines, the potential significance of construction-related emissions of NO_x and ROG is assessed by comparing the total average daily emissions from the Project to the threshold of significance. In order to calculate total average daily emissions, total Project construction-related emissions will be divided by the total number of days during the construction period. The total daily average is then compared to the threshold of significance. Based on current data from the Module, as well as Chevron's projected construction schedule and levels of activity, Chevron believes that emissions of NO_x and ROG will be significantly lower than those projected in the EIR. Nevertheless, since several Project components remain to be completed, it is impossible to predict with certainty whether total emissions of NO_x and ROG over the life of construction will result in the Project exceeding the thresholds of significance. Chevron is therefore implementing MM 4.3-2a and MM 4.3-2b, as follows:

MM 4.3-2a Implementation	
MM 4.3-2a Part(s)	Implementation Status
Chevron shall reduce construction-related NO_x emissions to less-than-significant levels by implementing one or more of the following feasible mitigation measures, all of which have been found to result in emissions reduction for construction projects:	
• Using lower emitting construction equipment, increasing carpooling or otherwise reducing	• As described above, ~89% of the engines in the cumulative construction fleet since the beginning

[3] Pursuant to Condition A7 of the Condition Use Permit (CUP), Chevron has ten (10) years in which to complete construction of the Project, with one automatic, two-year extension. Chevron has not yet determined when it might pursue construction of the remaining Project components.

[4] The SRU improvements are the final Project component scheduled to be constructed during the initial construction period, and Chevron completed construction of these improvements in 2019.

[5] Source: CalEEMod User Guide. OFFROAD Emission Factor Based on Engine Tier. http://caleemod.com/

[6] The calculation for percentage of equipment associated with each engine tier is based on actual weekly contractor equipment counts received from May 9, 2016 through July 3, 2022.

[7] This likelihood was recognized in the EIR, Appendix 4.3-CST, p. 6, n. 2: "Chevron Data Transmittal #36O (Rev#3), 2014 provides equipment data for eight consecutive quarters. Because the exact start date of future construction is uncertain, the emissions analysis conservatively uses emission factors for 2014 for the first four quarters of construction, and 2015 emission factors for the last four quarters of construction. A construction start date later than January 2014 would lead to lower emissions that than predicted here as the emissions profile of the construction fleet is cleaner, due to the implementation of regulations requiring lower emissions engines."

MM 4.3-2a Implementation	
construction-worker automobile use in daily commutes, extending the duration of construction by 1 year by delaying the modifications required to increase the throughput capacity of the FCC FHT until after construction of the hydrogen plant and amine contractor, or reducing the hours of use of construction equipment;	of project construction are Tier 4 Interim or Tier 4 Final, compared to the EIR, which assumed the majority of the fleet would have engines in Tiers 2 and 3. • Chevron has extended the initial construction period from two years.
• Reducing operations and/or emissions from portable generators at the Facility during the construction period, and thereby reducing NO_x emissions;	• The number of portable diesel generators used during construction has been reduced by, for example, utilizing solar-powered light standards for certain work areas. Approximately 2% of the cumulative hours for light plants since the beginning of project construction are attributed to light plants operating on solar power.
• Installing the low-NO_x burners included in the Modernization Project in the first 6 months of the construction period, thereby reducing net NO_x emissions from the Facility while construction of the Modernization Project continues;	• Chevron elected not to pursue this option as it does not believe it will be necessary to mitigate NO_x emissions to less-than-significant.
• Retiring permanent NO_x emission reduction credits to offset this temporary NO_x construction increase, in an amount sufficient to offset construction period NO_x emissions; or	• Chevron is prepared to retire NO_x emissions reduction credits as necessary to mitigate NO_x emissions.
• Implementing a combination of two or more of the above measures in an amount sufficient to offset construction-period NO_x emissions to less-than-significant levels.	• See above.

MM 4.3-2b Implementation	
MM 4.3-2b Part(s)	Implementation Status
Chevron shall reduce construction-related ROG emissions to less-than-significant levels by implementing one or more of the following feasible mitigation measures, all of which have been found to result in emissions reduction for construction projects:	
• Installing the tank dome Project Design Feature, and installing one additional tank dome, in the first 6 months of Project construction, thereby reducing net ROG emissions from the Facility before completing construction of the hydrogen plant or sulfur removal components of the Modernization Project;	• Chevron elected not to pursue the additional tank dome as it does not believe it will be necessary to mitigate ROG emissions to less-than-significant.
• Using lower emitting construction equipment, increasing carpooling or otherwise reducing construction-worker automobile use in daily commutes, extending the duration of construction by 1 year by delaying the modifications required to increase the throughput capacity of the FCC FHT until after construction of the hydrogen plant and amine contactor, or reducing the hours of use of construction equipment;	• As described above, ~89% of the engines in the cumulative construction fleet since the beginning of project construction are Tier 4 Interim or Tier 4 Final, compared to the EIR, which assumed the majority of the fleet would have engines in Tiers 2 and 3. • Chevron has extended the construction period from two years.

MM 4.3-2b Implementation	
• Retiring permanent ROG emission reduction credits to offset this temporary ROG construction increase, in an amount sufficient to offset construction-period ROG emissions; or	• Chevron is prepared to retire ROG emissions reduction credits as necessary to mitigate ROG emissions to less-than-significant.
• Implementing a combination of the above measures, in an amount sufficient to offset construction-period ROG emissions to less-than-significant levels.	• See above.

Details concerning implementation of the above-measures can be found in Chevron's 2018 Annual Compliance Report, submitted to the City on March 31, 2019 and accepted by the City's Planning Commission on June 6, 2019. Chevron submitted its 2019 Annual Compliance Report to the City on September 4, 2020 and its 2020 Annual Compliance Report to the City on August 31, 2021.

GHG

Pursuant to the BAAQMD CEQA Guidelines, the potential significance of construction-related emissions of GHG is assessed by comparing total annual emissions of GHG to the threshold of significance (10,000 MT CO_2e per year). Table 4Q2021-GHG shows total construction-related GHG emissions for years 2016 through 2021 4Q not including reductions associated with implementation of MM 4.8-1a – 4.8-1k. Because GHGs are tracked on an annual basis, the cumulative total for construction related GHG emissions resets to zero at the beginning of each calendar year.

Table 2Q2022– GHG Emissions from Construction

Year	Cumulative Total (in MT CO2e/yr)	BAAQMD Threshold of Significance (in MT CO2e/yr)
2016[1]	1,195.8	10,000
2017	7,638.1	10,000
2018[2]	11,959.0	10,000
2019[3]	2,196.0	10,000
2020[4]	2.5	10,000
2021[5]	97.2	10,000
2022[6]	0.5	10,000

[1] Based on data collected beginning May 9, 2016 and ending December 31, 2016
[2] For data collected through December 30, 2018.
[3] Based on data collected through December 30, 2019. This value also includes the GHG emissions calculated by the Construction Emissions Module for the week of December 31,2018 through January 6, 2019, as the majority of work days for that week occurred in 2019.
[4] For data collected through January 3, 2021.
[5] For data collected through January 2, 2022.
[6] For data collected through July 3, 2022.

Since commencement of Project construction in 2016, the total construction-related GHG emissions have not exceeded the annual threshold of significance, with the exception of calendar year 2018. The Project exceeded the annual threshold for GHG emissions in 2018 due to construction intensity. In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. Construction of this project commenced construction in 2Q2021 and completed in 1Q2022. Additionally, Chevron is implementing MM 4.8-1a – 4.8-1k, as described below.

MM 4.8-1 Implementation	
MM 4.8.1 Part(s)	Implementation Status[1]
Consistent with air quality mitigation measures for construction activities, Chevron would be required to implement the following mitigation measures to reduce its Project construction emissions. Implementation of the mitigation measures would result in further reductions in greenhouse gas emissions.	
a. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.	• Done
b. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxic Control Measure (Title 13 of California Code of Regulations [CCR], Section 2485). Clear signage shall be provided for construction workers at all access points.	• Done
c. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.	• Done
d. The idling time of diesel-powered construction equipment shall be limited to 2 minutes.	• Done
e. The Project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in construction (i.e., owned, leased, and subcontractor vehicles) would achieve a Project-wide fleet-average 20% nitrogen oxide reduction and 45% particulate matter reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions include the use of late model engines, Low-emission diesel products, Alternative fuels, Engine retrofit technology, After-treatment products, Add-on devices such as particular filters, and/or Other options as such become available. (Several of these measures would also reduce greenhouse gas emissions.)	• Done
f. All contractors shall be required to use equipment that meets CARB's most recent certification standard for off-road heavy-duty diesel engines.	• Done
g. Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).	• Done
h. Enforce and follow limits on idling time for commercial vehicles, including delivery and construction vehicles.	• Done
i. Using alternative fueled (e.g., biodiesel, electric) construction vehicles/equipment on at least 15% of the fleet.	• Done
j. Using local building materials of at least 10%.	• Done
k. Recycling or reusing at least 50% of construction waste or demolition materials.	• Done

MM 4.8-1 Implementation	
l. For each year of Project construction, Chevron shall hire, at commercially reasonable rates and at Chevron's expense, a qualified third-party entity reasonably acceptable to the City to quantify and verify in writing whether the reductions achieved from the above-described construction greenhouse gas mitigation measures for that year of Project construction adequately mitigated this potentially significant impact, which report shall be subject to City's reasonably approval. For any year of construction for which construction-related diesel emissions are not reduced to or below the 10,000-MT CO_2e per year significance threshold, Chevron shall implement one or more of the following measures in an amount sufficient to reduce construction period greenhouse gas emissions to less-than-significant levels: (i) Reduce diesel emissions from other equipment at the Facility, such as a diesel-powered generator, in an amount equal to the construction-related greenhouse gas emissions in excess of 10,000 MT CO_2e per year for any calendar year of Project construction, which reduced emission level Chevron shall maintain for the following two years. (ii) Permanently retire, or retrofit from diesel to electric power, one or more Facility sources that emit more than 300 MT CO_2e per year.	• Chevron is implementing MM 4.8-1a – 4.8-1k. Chevron worked with the City to finalize details regarding Chevron's proposed project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l. Project construction was completed in 1Q2022.

Details concerning implementation of the above measures can be found in Chevron's 2018 Annual Compliance Report, submitted to the City on March 31, 2019 and accepted by the City's Planning Commission on June 6, 2019. Chevron submitted its 2019 Annual Compliance Report to the City on September 4, 2020 and its 2020 Annual Compliance Report to the City on August 31, 2021.

CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
Construction Emissions Report
Third Quarter 2022
October 26, 2022

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

Pursuant to the Chevron Richmond Refinery Modernization Project (Project) Mitigation Monitoring and Reporting Program (MMRP), Chevron is required to provide quarterly compliance reports for emissions of NO_x (mitigation measure (MM) 4.3-2a), ROG (MM 4.3-2b), and greenhouse gases (GHG) (MM 4.8-1) during Project construction. This is the Construction Emissions Report for construction activity that occurred through the third quarter 2022 (3Q2022).[1]

Chevron tracks construction emissions using the Construction Emissions Module (Module) developed in conjunction with the City of Richmond's environmental consultant, Ramboll Environ, Inc. (Ramboll). The Module calculates emissions from On-Road Onsite Only vehicle use, On-Road Onsite and Offsite vehicle use, Off-Road Equipment, and Architectural Coating and Paving activities. The latest update to the Module, version 7.0, was issued to Chevron on January 23, 2017 with an additional revision to version 7.0 in 1Q2019 to include years 2019 through 2023 for data entry. Data from the Module is available for review at the Refinery.

As previously reported, construction activities related to the doming of T-3189 and the GHG Construction Mitigation Project were completed in 1Q2022. In 2Q2022, Chevron began planning and prework for demolition and dismantling of the existing Hydrogen Plant required under the CUP and MMRP and in 3Q2022, preliminary field work for the demolition and dismantling of the existing Hydrogen Plant commenced. Chevron will continue to track construction-related emissions accordingly.

As explained further below, based on current data and projections, Chevron anticipates that emissions of NO_x and ROG will be significantly lower than projected in the EIR. As secondary construction work is still underway, Chevron does not have enough data to predict whether the average daily emissions of NO_x and ROG will exceed the thresholds of significance once Project construction is complete.[2] Therefore, the Project is implementing MM 4.3-2a and MM 4.3-2b, as described below. For GHG emissions, Chevron is implementing MM 4.8-1a – 4.8-1k, as described below. In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. This project commenced construction in 2Q2021 and was completed in 1Q2022.

Construction Emissions Summary

Several factors are contributing to actual emissions from Project construction being lower than projected in the EIR.

First, when estimating construction emissions from the Project, the EIR conservatively assumed that all Project components would be constructed during a two-year construction period. (Draft EIR, p. 3-39; see also Table 3-2.) Chevron has elected to defer construction of the FCC FHT improvements (Draft EIR, p. 3-25) and improvements to one of the sulfur recovery units (SRU), resulting in less intensive construction during the initial construction period than was estimated in the EIR.[3] Further, the construction for the remaining Project components extended over a three

[1] Pursuant to Impact 4.3-3 of the Environmental Impact Report (EIR) prepared for the Project, emissions of PM_{10} and $PM_{2.5}$ from construction activities are less than significant without mitigation, though the EIR includes Improvement Measure 4.3-3 requiring certain best practices to be implemented. Further, the EIR did not analyze or require tracking or mitigation of CO during construction activities. However, Chevron uses the Construction Emissions Module to track PM_{10}, $PM_{2.5}$, and CO emissions, and maintains this data at the Refinery.

[2] For purposes of assessing potential impacts from the Project's construction-related emissions, the EIR utilized the California Environmental Air Quality Act Air Quality Guidelines promulgated by the Bay Area Air Quality Management District (BAAQMD CEQA Guidelines).

[3] Pursuant to Condition A7 of the Condition Use Permit (CUP), Chevron has ten (10) years in which to complete construction of the Project, with one automatic, two-year extension. Chevron has not yet determined when it might pursue construction of the remaining Project components.

year period approximately.[4] Project components still to be completed include demolition and dismantling of the existing Hydrogen Plant, which will further extend the Project construction period. This means the total number of days during the construction period by which total emissions of NOx and ROG will be divided to determine the respective average daily emissions will be greater than used in the EIR.

Further, because the EIR did not have specific data concerning the fleet to be used during construction, it made a conservative assumption that the majority of engines were Tier 2 and Tier 3. In the case of off-road equipment, emissions from equipment with higher tier engines (i.e., of equal horsepower) are generally less than emissions from equipment with lower tier engines[5]. Higher tier engines are associated with a lower emission factor, resulting in lower emissions when compared to emissions from lower tier engines. To date, actual data shows that ~89% of engines in the cumulative fleet since the beginning of project construction are Tier 4 Interim or Tier 4 Final.[6] Of the remaining ~11% of the engines, 9.4% are Tier 3, and 1.7% are Tier 2, with a negligible quantity of Tier 1 engines in the fleet (i.e., below 1%). Therefore, the Project's use of Tier 4 Interim and Tier 4 Final engines, where possible, has contributed to actual Project construction emissions that are lower than the emissions projected in the EIR.[7]

Ozone Precursors

Pursuant to the BAAQMD CEQA Guidelines, the potential significance of construction-related emissions of NO_x and ROG is assessed by comparing the total average daily emissions from the Project to the threshold of significance. In order to calculate total average daily emissions, total Project construction-related emissions will be divided by the total number of days during the construction period. The total daily average is then compared to the threshold of significance. Based on current data from the Module, as well as Chevron's projected construction schedule and levels of activity, Chevron believes that emissions of NO_x and ROG will be significantly lower than those projected in the EIR. Nevertheless, since several Project components remain to be completed, it is impossible to predict with certainty whether total emissions of NO_x and ROG over the life of construction will result in the Project exceeding the thresholds of significance. Chevron is therefore implementing MM 4.3-2a and MM 4.3-2b, as follows:

MM 4.3-2a Implementation	
MM 4.3-2a Part(s)	Implementation Status
Chevron shall reduce construction-related NO_x emissions to less-than-significant levels by implementing one or more of the following feasible mitigation measures, all of which have been found to result in emissions reduction for construction projects:	
• Using lower emitting construction equipment, increasing carpooling or otherwise reducing construction-worker automobile use in daily commutes, extending the duration of construction	• As described above, ~89% of the engines in the cumulative construction fleet since the beginning of project construction are Tier 4 Interim or Tier 4 Final, compared to the EIR, which assumed the

[4] The SRU improvements are the final Project component scheduled to be constructed during the initial construction period, and Chevron completed construction of these improvements in 2019.

[5] Source: CalEEMod User Guide. OFFROAD Emission Factor Based on Engine Tier. http://caleemod.com/

[6] The calculation for percentage of equipment associated with each engine tier is based on actual weekly contractor equipment counts received from May 9, 2016 through July 3, 2022.

[7] This likelihood was recognized in the EIR, Appendix 4.3-CST, p. 6, n. 2: "Chevron Data Transmittal #36O (Rev#3), 2014 provides equipment data for eight consecutive quarters. Because the exact start date of future construction is uncertain, the emissions analysis conservatively uses emission factors for 2014 for the first four quarters of construction, and 2015 emission factors for the last four quarters of construction. A construction start date later than January 2014 would lead to lower emissions that than predicted here as the emissions profile of the construction fleet is cleaner, due to the implementation of regulations requiring lower emissions engines."

MM 4.3-2a Implementation	
by 1 year by delaying the modifications required to increase the throughput capacity of the FCC FHT until after construction of the hydrogen plant and amine contractor, or reducing the hours of use of construction equipment;	majority of the fleet would have engines in Tiers 2 and 3. • Chevron has extended the initial construction period from two years.
• Reducing operations and/or emissions from portable generators at the Facility during the construction period, and thereby reducing NO_x emissions;	• The number of portable diesel generators used during construction has been reduced by, for example, utilizing solar-powered light standards for certain work areas. Approximately 2% of the cumulative hours for light plants since the beginning of project construction are attributed to light plants operating on solar power.
• Installing the low-NO_x burners included in the Modernization Project in the first 6 months of the construction period, thereby reducing net NO_x emissions from the Facility while construction of the Modernization Project continues;	• Chevron elected not to pursue this option as it does not believe it will be necessary to mitigate NO_x emissions to less-than-significant.
• Retiring permanent NO_x emission reduction credits to offset this temporary NO_x construction increase, in an amount sufficient to offset construction period NO_x emissions; or	• Chevron is prepared to retire NO_x emissions reduction credits as necessary to mitigate NO_x emissions.
• Implementing a combination of two or more of the above measures in an amount sufficient to offset construction-period NO_x emissions to less-than-significant levels.	• See above.

MM 4.3-2b Implementation	
MM 4.3-2b Part(s)	Implementation Status
Chevron shall reduce construction-related ROG emissions to less-than-significant levels by implementing one or more of the following feasible mitigation measures, all of which have been found to result in emissions reduction for construction projects:	
• Installing the tank dome Project Design Feature, and installing one additional tank dome, in the first 6 months of Project construction, thereby reducing net ROG emissions from the Facility before completing construction of the hydrogen plant or sulfur removal components of the Modernization Project;	• Chevron elected not to pursue the additional tank dome as it does not believe it will be necessary to mitigate ROG emissions to less-than-significant.
• Using lower emitting construction equipment, increasing carpooling or otherwise reducing construction-worker automobile use in daily commutes, extending the duration of construction by 1 year by delaying the modifications required to increase the throughput capacity of the FCC FHT until after construction of the hydrogen plant and amine contactor, or reducing the hours of use of construction equipment;	• As described above, ~89% of the engines in the cumulative construction fleet since the beginning of project construction are Tier 4 Interim or Tier 4 Final, compared to the EIR, which assumed the majority of the fleet would have engines in Tiers 2 and 3. • Chevron has extended the construction period from two years.

MM 4.3-2b Implementation	
• Retiring permanent ROG emission reduction credits to offset this temporary ROG construction increase, in an amount sufficient to offset construction-period ROG emissions; or	• Chevron is prepared to retire ROG emissions reduction credits as necessary to mitigate ROG emissions to less-than-significant.
• Implementing a combination of the above measures, in an amount sufficient to offset construction-period ROG emissions to less-than-significant levels.	• See above.

Details concerning implementation of the above measures can be found in Chevron's Annual Compliance Reports, the most recent of which was submitted to the City on September 1, 2022.

GHG

Pursuant to the BAAQMD CEQA Guidelines, the potential significance of construction-related emissions of GHG is assessed by comparing total annual emissions of GHG to the threshold of significance (10,000 MT CO_2e per year). Table 4Q2021-GHG shows total construction-related GHG emissions for years 2016 through 2021 4Q not including reductions associated with implementation of MM 4.8-1a – 4.8-1k. Because GHGs are tracked on an annual basis, the cumulative total for construction related GHG emissions resets to zero at the beginning of each calendar year.

Table 3Q2022– GHG Emissions from Construction

Year	Cumulative Total (in MT CO2e/yr)	BAAQMD Threshold of Significance (in MT CO2e/yr)
2016[1]	1,195.8	10,000
2017	7,638.1	10,000
2018[2]	11,959.0	10,000
2019[3]	2,196.0	10,000
2020[4]	2.5	10,000
2021[5]	97.2	10,000
2022[6]	3.5	10,000

[1] Based on data collected beginning May 9, 2016 and ending December 31, 2016
[2] For data collected through December 30, 2018.
[3] Based on data collected through December 30, 2019. This value also includes the GHG emissions calculated by the Construction Emissions Module for the week of December 31,2018 through January 6, 2019, as the majority of work days for that week occurred in 2019.
[4] For data collected through January 3, 2021.
[5] For data collected through January 2, 2022.
[6] For data collected through October 2, 2022.

Since commencement of Project construction in 2016, the total construction related GHG emissions have not exceeded the annual threshold of significance, with the exception of calendar year 2018. The Project exceeded the annual threshold for GHG emissions in 2018 due to construction intensity. In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. Construction of this project commenced construction in 2Q2021 and completed in 1Q2022. Additionally, Chevron is implementing MM 4.8-1a – 4.8-1k, as described below.

MM 4.8-1 Implementation	
MM 4.8.1 Part(s)	Implementation Status[1]
Consistent with air quality mitigation measures for construction activities, Chevron would be required to implement the following mitigation measures to reduce its Project construction emissions. Implementation of the mitigation measures would result in further reductions in greenhouse gas emissions.	
a. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.	• Done
b. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxic Control Measure (Title 13 of California Code of Regulations [CCR], Section 2485). Clear signage shall be provided for construction workers at all access points.	• Done
c. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.	• Done
d. The idling time of diesel-powered construction equipment shall be limited to 2 minutes.	• Done
e. The Project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in construction (i.e., owned, leased, and subcontractor vehicles) would achieve a Project-wide fleet-average 20% nitrogen oxide reduction and 45% particulate matter reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions include the use of late model engines, Low-emission diesel products, Alternative fuels, Engine retrofit technology, After-treatment products, Add-on devices such as particular filters, and/or Other options as such become available. (Several of these measures would also reduce greenhouse gas emissions.)	• Done
f. All contractors shall be required to use equipment that meets CARB's most recent certification standard for off-road heavy-duty diesel engines.	• Done
g. Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).	• Done
h. Enforce and follow limits on idling time for commercial vehicles, including delivery and construction vehicles.	• Done
i. Using alternative fueled (e.g., biodiesel, electric) construction vehicles/equipment on at least 15% of the fleet.	• Done
j. Using local building materials of at least 10%.	• Done

MM 4.8-1 Implementation	
k. Recycling or reusing at least 50% of construction waste or demolition materials.	• Done
l. For each year of Project construction, Chevron shall hire, at commercially reasonable rates and at Chevron's expense, a qualified third-party entity reasonably acceptable to the City to quantify and verify in writing whether the reductions achieved from the above-described construction greenhouse gas mitigation measures for that year of Project construction adequately mitigated this potentially significant impact, which report shall be subject to City's reasonably approval. For any year of construction for which construction-related diesel emissions are not reduced to or below the 10,000-MT CO_2e per year significance threshold, Chevron shall implement one or more of the following measures in an amount sufficient to reduce construction period greenhouse gas emissions to less-than-significant levels: (i) Reduce diesel emissions from other equipment at the Facility, such as a diesel-powered generator, in an amount equal to the construction-related greenhouse gas emissions in excess of 10,000 MT CO_2e per year for any calendar year of Project construction, which reduced emission level Chevron shall maintain for the following two years. (ii) Permanently retire, or retrofit from diesel to electric power, one or more Facility sources that emit more than 300 MT CO_2e per year.	• Chevron is implementing MM 4.8-1a – 4.8-1k. Chevron worked with the City to finalize details regarding Chevron's proposed project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l. Project construction was completed in 1Q2022.

Details concerning implementation of the above-measures can be found in Chevron's Annual Compliance Reports, the most recent of which was submitted to the City on September 1, 2022.

CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
Construction Emissions Report
Fourth Quarter 2022
January 30, 2023

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

Pursuant to the Chevron Richmond Refinery Modernization Project (Project) Mitigation Monitoring and Reporting Program (MMRP), Chevron is required to provide quarterly compliance reports for emissions of NO_x (mitigation measure (MM) 4.3-2a), ROG (MM 4.3-2b), and greenhouse gases (GHG) (MM 4.8-1) during Project construction. This is the Construction Emissions Report for construction activity that occurred through the fourth quarter 2022 (4Q2022).[1]

Chevron tracks construction emissions using the Construction Emissions Module (Module) developed in conjunction with the City of Richmond's environmental consultant, Ramboll Environ, Inc. (Ramboll). The Module calculates emissions from On-Road Onsite Only vehicle use, On-Road Onsite and Offsite vehicle use, Off-Road Equipment, and Architectural Coating and Paving activities. The latest update to the Module, version 7.0, was issued to Chevron on January 23, 2017, with an additional revision to version 7.0 in 1Q2019 to include years 2019 through 2023 for data entry. Data from the Module is available for review at the Refinery.

As previously reported, construction activities related to the doming of T-3189 and the GHG Construction Mitigation Project were completed in 1Q2022. In 4Q2022, Chevron performed field work associated with the removal of instrumentation and electrical equipment located at the old Hydrogen Plant. Chevron will continue to track construction-related emissions accordingly.

As explained further below, based on current data and projections, Chevron anticipates that emissions of NO_x and ROG will be significantly lower than projected in the EIR. As secondary construction work is still underway, Chevron does not have enough data to predict whether the average daily emissions of NO_x and ROG will exceed the thresholds of significance once Project construction is complete.[2] Therefore, the Project is implementing MM 4.3-2a and MM 4.3-2b, as described below. For GHG emissions, Chevron is implementing MM 4.8-1a – 4.8-1k, as described below. In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. This project commenced construction in 2Q2021 and was completed in 1Q2022.

Construction Emissions Summary

Several factors are contributing to actual emissions from Project construction being lower than projected in the EIR.

First, when estimating construction emissions from the Project, the EIR conservatively assumed that all Project components would be constructed during a two-year construction period. (Draft EIR, p. 3-39; see also Table 3-2.) Chevron has elected to defer construction of the FCC FHT improvements (Draft EIR, p. 3-25) and improvements to one of the sulfur recovery units (SRU), resulting in less intensive construction during the initial construction period than was estimated in the EIR.[3] Further, the construction for the remaining Project components extended over a three

[1] Pursuant to Impact 4.3-3 of the Environmental Impact Report (EIR) prepared for the Project, emissions of PM_{10} and $PM_{2.5}$ from construction activities are less than significant without mitigation, though the EIR includes Improvement Measure 4.3-3 requiring certain best practices to be implemented. Further, the EIR did not analyze or require tracking or mitigation of CO during construction activities. However, Chevron uses the Construction Emissions Module to track PM_{10}, $PM_{2.5}$, and CO emissions, and maintains this data at the Refinery.

[2] For purposes of assessing potential impacts from the Project's construction-related emissions, the EIR utilized the California Environmental Air Quality Act Air Quality Guidelines promulgated by the Bay Area Air Quality Management District (BAAQMD CEQA Guidelines).

[3] Pursuant to Condition A7 of the Condition Use Permit (CUP), Chevron has ten (10) years in which to complete construction of the Project, with one automatic, two-year extension. Chevron has not yet determined when it might pursue construction of the remaining Project components.

year period approximately.[4] Project components still to be completed include demolition and dismantling of the existing Hydrogen Plant, which will further extend the Project construction period. This means the total number of days during the construction period by which total emissions of NOx and ROG will be divided to determine the respective average daily emissions will be greater than used in the EIR.

Further, because the EIR did not have specific data concerning the fleet to be used during construction, it made a conservative assumption that the majority of engines were Tier 2 and Tier 3. In the case of off-road equipment, emissions from equipment with higher tier engines (i.e., of equal horsepower) are generally less than emissions from equipment with lower tier engines[5]. Higher tier engines are associated with a lower emission factor, resulting in lower emissions when compared to emissions from lower tier engines. To date, actual data shows that ~89% of engines in the cumulative fleet since the beginning of project construction are Tier 4 Interim or Tier 4 Final.[6] Of the remaining ~11% of the engines, 9.4% are Tier 3, and 1.7% are Tier 2, with a negligible quantity of Tier 1 engines in the fleet (i.e., below 1%). Therefore, the Project's use of Tier 4 Interim and Tier 4 Final engines, where possible, has contributed to actual Project construction emissions that are lower than the emissions projected in the EIR.[7]

Ozone Precursors

Pursuant to the BAAQMD CEQA Guidelines, the potential significance of construction-related emissions of NO_x and ROG is assessed by comparing the total average daily emissions from the Project to the threshold of significance. In order to calculate total average daily emissions, total Project construction-related emissions will be divided by the total number of days during the construction period. The total daily average is then compared to the threshold of significance. Based on current data from the Module, as well as Chevron's projected construction schedule and levels of activity, Chevron believes that emissions of NO_x and ROG will be significantly lower than those projected in the EIR. Nevertheless, since several Project components remain to be completed, it is impossible to predict with certainty whether total emissions of NO_x and ROG over the life of construction will result in the Project exceeding the thresholds of significance. Chevron is therefore implementing MM 4.3-2a and MM 4.3-2b, as follows:

MM 4.3-2a Implementation	
MM 4.3-2a Part(s)	Implementation Status
Chevron shall reduce construction-related NO_x emissions to less-than-significant levels by implementing one or more of the following feasible mitigation measures, all of which have been found to result in emissions reduction for construction projects:	
• Using lower emitting construction equipment, increasing carpooling or otherwise reducing construction-worker automobile use in daily commutes, extending the duration of construction	• As described above, ~89% of the engines in the cumulative construction fleet since the beginning of project construction are Tier 4 Interim or Tier 4 Final, compared to the EIR, which assumed the

[4] The SRU improvements are the final Project component scheduled to be constructed during the initial construction period, and Chevron completed construction of these improvements in 2019.

[5] Source: CalEEMod User Guide. OFFROAD Emission Factor Based on Engine Tier. http://caleemod.com/

[6] The calculation for percentage of equipment associated with each engine tier is based on actual weekly contractor equipment counts received from May 9, 2016 through July 3, 2022.

[7] This likelihood was recognized in the EIR, Appendix 4.3-CST, p. 6, n. 2: "Chevron Data Transmittal #36O (Rev#3), 2014 provides equipment data for eight consecutive quarters. Because the exact start date of future construction is uncertain, the emissions analysis conservatively uses emission factors for 2014 for the first four quarters of construction, and 2015 emission factors for the last four quarters of construction. A construction start date later than January 2014 would lead to lower emissions that than predicted here as the emissions profile of the construction fleet is cleaner, due to the implementation of regulations requiring lower emissions engines."

MM 4.3-2a Implementation	
by 1 year by delaying the modifications required to increase the throughput capacity of the FCC FHT until after construction of the hydrogen plant and amine contractor, or reducing the hours of use of construction equipment;	majority of the fleet would have engines in Tiers 2 and 3. • Chevron has extended the initial construction period from two years.
• Reducing operations and/or emissions from portable generators at the Facility during the construction period, and thereby reducing NO_x emissions;	• The number of portable diesel generators used during construction has been reduced by, for example, utilizing solar-powered light standards for certain work areas. Approximately 2% of the cumulative hours for light plants since the beginning of project construction are attributed to light plants operating on solar power.
• Installing the low-NO_x burners included in the Modernization Project in the first 6 months of the construction period, thereby reducing net NO_x emissions from the Facility while construction of the Modernization Project continues;	• Chevron elected not to pursue this option as it does not believe it will be necessary to mitigate NO_x emissions to less-than-significant.
• Retiring permanent NO_x emission reduction credits to offset this temporary NO_x construction increase, in an amount sufficient to offset construction period NO_x emissions; or	• Chevron is prepared to retire NO_x emissions reduction credits as necessary to mitigate NO_x emissions.
• Implementing a combination of two or more of the above measures in an amount sufficient to offset construction-period NO_x emissions to less-than-significant levels.	• See above.

MM 4.3-2b Implementation	
MM 4.3-2b Part(s)	Implementation Status
Chevron shall reduce construction-related ROG emissions to less-than-significant levels by implementing one or more of the following feasible mitigation measures, all of which have been found to result in emissions reduction for construction projects:	
• Installing the tank dome Project Design Feature, and installing one additional tank dome, in the first 6 months of Project construction, thereby reducing net ROG emissions from the Facility before completing construction of the hydrogen plant or sulfur removal components of the Modernization Project;	• Chevron elected not to pursue the additional tank dome as it does not believe it will be necessary to mitigate ROG emissions to less-than-significant.
• Using lower emitting construction equipment, increasing carpooling or otherwise reducing construction-worker automobile use in daily commutes, extending the duration of construction by 1 year by delaying the modifications required to increase the throughput capacity of the FCC FHT until after construction of the hydrogen plant and amine contactor, or reducing the hours of use of construction equipment;	• As described above, ~89% of the engines in the cumulative construction fleet since the beginning of project construction are Tier 4 Interim or Tier 4 Final, compared to the EIR, which assumed the majority of the fleet would have engines in Tiers 2 and 3. • Chevron has extended the construction period from two years.

MM 4.3-2b Implementation	
• Retiring permanent ROG emission reduction credits to offset this temporary ROG construction increase, in an amount sufficient to offset construction-period ROG emissions; or	• Chevron is prepared to retire ROG emissions reduction credits as necessary to mitigate ROG emissions to less-than-significant.
• Implementing a combination of the above measures, in an amount sufficient to offset construction-period ROG emissions to less-than-significant levels.	• See above.

Details concerning implementation of the above measures can be found in Chevron's Annual Compliance Reports, the most recent of which was submitted to the City on September 1, 2022.

GHG

Pursuant to the BAAQMD CEQA Guidelines, the potential significance of construction-related emissions of GHG is assessed by comparing total annual emissions of GHG to the threshold of significance (10,000 MT CO_2e per year). Table 4Q2021-GHG shows total construction-related GHG emissions for years 2016 through 2021 4Q not including reductions associated with implementation of MM 4.8-1a – 4.8-1k. Because GHGs are tracked on an annual basis, the cumulative total for construction related GHG emissions resets to zero at the beginning of each calendar year.

Table 3Q2022– GHG Emissions from Construction

Year	Cumulative Total (in MT CO2e/yr)	BAAQMD Threshold of Significance (in MT CO2e/yr)
2016[1]	1,195.8	10,000
2017	7,638.1	10,000
2018[2]	11,959.0	10,000
2019[3]	2,196.0	10,000
2020[4]	2.5	10,000
2021[5]	97.2	10,000
2022[6]	12.1	10,000

[1] Based on data collected beginning May 9, 2016 and ending December 31, 2016
[2] For data collected through December 30, 2018.
[3] Based on data collected through December 30, 2019. This value also includes the GHG emissions calculated by the Construction Emissions Module for the week of December 31,2018 through January 6, 2019, as the majority of work days for that week occurred in 2019.
[4] For data collected through January 3, 2021.
[5] For data collected through January 2, 2022.
[6] For data collected through January 1, 2023.

Since commencement of Project construction in 2016, the total construction related GHG emissions have not exceeded the annual threshold of significance, with the exception of calendar year 2018. The Project exceeded the annual threshold for GHG emissions in 2018 due to construction intensity. In May 2019, Chevron proposed a project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l and worked with the City to finalize details and gain concurrence from the City. Construction of this project commenced construction in 2Q2021 and completed in 1Q2022. Additionally, Chevron is implementing MM 4.8-1a – 4.8-1k, as described below.

MM 4.8-1 Implementation	
MM 4.8.1 Part(s)	Implementation Status[1]
Consistent with air quality mitigation measures for construction activities, Chevron would be required to implement the following mitigation measures to reduce its Project construction emissions. Implementation of the mitigation measures would result in further reductions in greenhouse gas emissions.	
a. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.	• Done
b. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxic Control Measure (Title 13 of California Code of Regulations [CCR], Section 2485). Clear signage shall be provided for construction workers at all access points.	• Done
c. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.	• Done
d. The idling time of diesel-powered construction equipment shall be limited to 2 minutes.	• Done
e. The Project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in construction (i.e., owned, leased, and subcontractor vehicles) would achieve a Project-wide fleet-average 20% nitrogen oxide reduction and 45% particulate matter reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions include the use of late model engines, Low-emission diesel products, Alternative fuels, Engine retrofit technology, After-treatment products, Add-on devices such as particular filters, and/or Other options as such become available. (Several of these measures would also reduce greenhouse gas emissions.)	• Done
f. All contractors shall be required to use equipment that meets CARB's most recent certification standard for off-road heavy-duty diesel engines.	• Done
g. Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).	• Done
h. Enforce and follow limits on idling time for commercial vehicles, including delivery and construction vehicles.	• Done
i. Using alternative fueled (e.g., biodiesel, electric) construction vehicles/equipment on at least 15% of the fleet.	• Done
j. Using local building materials of at least 10%.	• Done

MM 4.8-1 Implementation	
k. Recycling or reusing at least 50% of construction waste or demolition materials.	• Done
l. For each year of Project construction, Chevron shall hire, at commercially reasonable rates and at Chevron's expense, a qualified third-party entity reasonably acceptable to the City to quantify and verify in writing whether the reductions achieved from the above-described construction greenhouse gas mitigation measures for that year of Project construction adequately mitigated this potentially significant impact, which report shall be subject to City's reasonably approval. For any year of construction for which construction-related diesel emissions are not reduced to or below the 10,000-MT CO_2e per year significance threshold, Chevron shall implement one or more of the following measures in an amount sufficient to reduce construction period greenhouse gas emissions to less-than-significant levels: (i) Reduce diesel emissions from other equipment at the Facility, such as a diesel-powered generator, in an amount equal to the construction-related greenhouse gas emissions in excess of 10,000 MT CO_2e per year for any calendar year of Project construction, which reduced emission level Chevron shall maintain for the following two years. (ii) Permanently retire, or retrofit from diesel to electric power, one or more Facility sources that emit more than 300 MT CO_2e per year.	• Chevron is implementing MM 4.8-1a – 4.8-1k. Chevron worked with the City to finalize details regarding Chevron's proposed project to mitigate 2018 construction-related GHG emissions consistent with MM 4.8-1l. Project construction was completed in 1Q2022.

Details concerning implementation of the above measures can be found in Chevron's Annual Compliance Reports, the most recent of which was submitted to the City on September 1, 2022.

ATTACHMENT 6
Semi-Annual Construction Progress Reports
Operational Year 2022

CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
Condition of Approval H3 Semi-Annual Construction Report

October 26, 2022

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

INTRODUCTION

This report is submitted pursuant to the Conditional Use Permit (CUP) for the Chevron Modernization Project, Section H, Monitoring, Record Keeping, Reporting and Public Notification, Condition of Approval H3, which states:

> "Chevron shall submit semi-annual construction progress reports to the Planning and Building Services Department on March 31 and October 31 during all phases of project construction."

This is the thirteenth semi-annual construction progress report and provides a general overview on the status of construction for the Modernization Project.

REPORT

Construction Summary

In 2019, Chevron completed primary construction of the new Hydrogen Plant and sulfur removal improvements. Decommissioning activities at the old Hydrogen Plant, doming of tank T-3202, demolition of the old sulfur loading racks, and work at the boiler feedwater plant and sodium bisulfite plant were also completed in 2019. Additionally, the contractors supporting primary construction activities demobilized. In 2020, Chevron continued to undertake secondary construction activities required under the CUP and MMRP, subject to limitation resulting from COVID-19. This work included: ancillary work in support of the doming of T-3202, work associated with placing new process plants and equipment into service, and preliminary work associated with dismantling of the old hydrogen plant. Construction activities related to the doming of T-3189 and the GHG Construction Mitigation Project commenced in 2021 and were completed in 1Q2022. Project components still to be completed include demolition and dismantling of the existing Hydrogen Plant. Preliminary field work for the demolition and dismantling of the existing Hydrogen Plant commenced on September 1, 2022.

Refinery site management took ownership of the Modernization Project construction following commencement of Project operations in 2019. Project responsibilities are now owned by the Refinery, and Chevron's permitting and project teams are in regular contact with the City's Building Division concerning ongoing permitting and construction activities.

As initially reported to the City on June 16, 2016, and quarterly thereafter, Chevron is implementing all construction-related mitigation measures from the Chevron Modernization Project Environmental Impact Report certified by the City on July 29, 2014, with oversight from the City. Effective 2Q2019, the submittals of the Construction Questionnaire are made to the City via email, replacing use of the City's Antea software. The First and Second Quarter 2022 Modernization Construction Questionnaires were submitted to the City via email on April 29, 2022 and July 29, 2022 respectively.

More than 50% of total waste project streams are being recycled or reused, as required by Mitigation Measure 4.8-1k. The construction equipment fleet is exceeding targets for reduced emissions of oxides of nitrogen (NOx) and particulate matter (PM) compared to CARB fleet averages, as required by Mitigation Measure 4.8-1e. Chevron continues to track construction emissions using the Construction Emissions module provided by the City's consultant, Ramboll. Pursuant to the MMRP, a separate construction emissions report (a.k.a., Construction Emissions Report) is submitted to the City as part of the quarterly Construction Questionnaire responses.

CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
Condition of Approval H3 Semi-Annual Construction Report

March 29, 2023

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

INTRODUCTION

This report is submitted pursuant to the Conditional Use Permit (CUP) for the Chevron Modernization Project, Section H, Monitoring, Record Keeping, Reporting and Public Notification, Condition of Approval H3, which states:

> "Chevron shall submit semi-annual construction progress reports to the Planning and Building Services Department on March 31 and October 31 during all phases of project construction."

This is the thirteenth semi-annual construction progress report and provides a general overview on the status of construction for the Modernization Project.

REPORT

Construction Summary

In 2019, Chevron completed primary construction of the new Hydrogen Plant and sulfur removal improvements. Decommissioning activities at the old Hydrogen Plant, doming of tank T-3202, demolition of the old sulfur loading racks, and work at the boiler feedwater plant and sodium bisulfite plant were also completed in 2019. Additionally, the contractors supporting primary construction activities demobilized. In 2020, Chevron continued to undertake secondary construction activities required under the CUP and MMRP, subject to limitation resulting from COVID-19. This work included: ancillary work in support of the doming of T-3202, work associated with placing new process plants and equipment into service, and preliminary work associated with dismantling of the old hydrogen plant. Construction activities related to the doming of T-3189 and the GHG Construction Mitigation Project commenced in 2021 and were completed in 1Q2022. Project components still to be completed include demolition and dismantling of the existing Hydrogen Plant. Preliminary field work for the dismantling of the existing Hydrogen Plant commenced on September 1, 2022, and is ongoing. This work includes the removal of instrumentation and electrical equipment.

Refinery site management took ownership of the Modernization Project construction following commencement of Project operations in 2019. Project responsibilities are now owned by the Refinery, and Chevron's permitting and project teams are in regular contact with the City's Building Division concerning ongoing permitting and construction activities.

As initially reported to the City on June 16, 2016, and quarterly thereafter, Chevron is implementing all construction-related mitigation measures from the Chevron Modernization Project Environmental Impact Report certified by the City on July 29, 2014, with oversight from the City. Effective 2Q2019, the submittals of the Construction Questionnaire are made to the City via email, replacing use of the City's Antea software. The Third and Fourth Quarter 2022 Modernization Construction Questionnaires were submitted to the City via email on October 26, 2022 and January 30, 2023 respectively.

More than 50% of total waste project streams are being recycled or reused, as required by Mitigation Measure 4.8-1k. The construction equipment fleet is exceeding targets for reduced emissions of oxides of nitrogen (NOx) and particulate matter (PM) compared to CARB fleet averages, as required by Mitigation Measure 4.8-1e. Chevron continues to track construction emissions using the Construction Emissions module provided by the City's consultant, Ramboll. Pursuant to the MMRP, a separate construction emissions report (a.k.a., Construction Emissions Report) is submitted to the City as part of the quarterly Construction Questionnaire responses.

CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
Mitigation Measure 4.13-7a Annual Report Regarding Implementation of the Modernization Project Reliability Program

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

INTRODUCTION

This report is submitted pursuant to section IV.H of the Modernization Project Reliability Program (Program), as incorporated by mitigation measure (MM) 4.13-7a of the Modernization Project Mitigation Monitoring and Reporting Program (MMRP). Pursuant to section IV.H:

> "As part of its ongoing reporting obligation under the [MMRP] adopted by the City, Chevron shall report on the status of all requirements of this Reliability Program on an annual basis in a form acceptable to the City."

Pursuant to MM 4.13-7a, "an initial Reliability Program report shall be submitted to the City and County prior to Project construction. Annual reports shall be submitted thereafter, including a report prior to the commencement of Project operations…"

Chevron submitted its initial Program report on June 16, 2016 and provided an update to that report on October 7, 2016. Chevron submitted its second, third, fourth, fifth, sixth, and seventh Program reports on June 14, 2017, September 4, 2018, December 11, 2019, August 31, 2020, August 31, 2021, and September 1, 2022, respectively. This report is the eighth annual Program report and provides a general overview regarding the status of Chevron's implementation of Sections II – IV of the Program.[1] A copy of the Program is submitted herewith for purposes of tracking the responses below with the Program commitments. See Attachment RP-1.

Chevron also recognizes that there are Reliability Program-related CUP and MMRP obligations which are to be included as part of this Reliability Program report. Attachment RP-2 includes Chevron's implementation status of these requirements.

REPORT

II. General Recommendations and Refinery Actions to Address

Chevron's actions to implement the general recommendations are described in Attachment RP-3. Contra Costa Health Services (CCHS) reviewed Chevron's implementation of the general recommendations as part of its 2018 pre-startup review of the Reliability Program components and no further action was required.

III. Project Recommendations

Section III includes project-specific recommendations that are being implemented as a result of the Reliability Analysis.

A. Schedule and Report on Upgrades to Identified Piping Circuits

Chevron separately submitted the final report to the City pursuant to this requirement on August 15, 2018. CCHS verified implementation of this measure in August 2018. A copy of this report was included with the 2018 Reliability Program report. No further action is required.

[1] Section I of the Reliability Program is the Introduction and does not contain any recommendations or action items.

B. Installation and Monitoring of Additional Permasense® Monitors on Identified Circuits

As part of the work to upgrade the piping circuits per III.C.2 of this Reliability Program, which included identification of new locations for Permasense® monitors on 4CU piping circuits, Chevron completed an upgrade of the Permasense® monitors and system for the upgraded and existing piping circuits. Hot work for installation of the upgraded Permasense® monitors was completed during the 4CU turnaround in 4Q2016. These installations include a total of 118 monitoring locations, of which 9 are located on the outlet piping of F-1100A/B to C-1100. CCHS reviewed records demonstrating compliance with this measure in August 2018.

The Refinery also committed to the installation of 25 additional Permasense® monitors on carbon steel circuits in the Solvent De-Asphalter (SDA). Pursuant to letter dated July 31, 2018, Chevron requested the authority to install these monitors during its next scheduled SDA turnaround. The City approved this request on August 30, 2018. The monitors were successfully installed during the SDA turnaround. Chevron notified the City of the completion of installation on August 14, 2019. A copy of the City approval and notification of completion was included in the 2019 Report. CCHS reviewed records demonstrating completion of this condition in June 2020.

C. Crude Unit Recommendations

The following preventative measures were included in the Program based on the belief that operational and feedstock changes from the Project could result in increased damage mechanism activity in the Crude Unit post-Project:

1. Since the Modernization Project did not commence operation prior to the referenced "2017 turnaround", this obligation is moot.

2. Chevron separately submitted a report to the City pursuant to this requirement on August 15, 2018. CCHS verified completion of this measure in August 2018. A copy of this report was included with the 2018 Reliability Program report.

3. Chevron has separately submitted a report to the City pursuant to this requirement on August 15, 2018. CCHS verified completion of this measure in May 2018. A copy of this report was included with the 2018 Reliability Program report.

4. Tests have been run by Chevron on crude samples and crude blends to improve our understanding of the effects of sulfur speciation and H_2S evolution on sulfidation corrosion. The results of this testing are considered Confidential Business Information and were reviewed by CCHS as part of its pre-operations verification in August 2018.

5. The integrity operating window (IOW) program has been implemented for critical Crude Unit parameters per API 584, with IOW table, alarm and alert structure, corrective actions, required bypass mitigations, and training. CCHS reviewed records demonstrating compliance with this measure in May 2018.

6. This obligation requires that Crude Splitter software predicted results be verified when identified trigger points (2.25 wt% and 2.75 wt % sulfur on an annual average) are reached. Chevron is monitoring crude sulfur content on a monthly basis, has implemented a Crude Sulfur Monitoring process that alerts Reliability Program task owners when crude sulfur triggers of 2.25 wt% or 2.75% are forecasted and reached. This process assigns responsibilities across various organizations, including Strategic Planning, Oils Planning, Finance, Technical, and OE/PSM, and includes periodic checks by key process owners within these organizations. Since commencement of Project operations, average sulfur content of crude has not reached this trigger point.

   Chevron has revised the Asset Integrity Plans for V-1100 Crude Unit Atmospheric Column Reflux Drum, V-1190 Stabilizer Column Reflux Drum, and V-1160 Vacuum Column Overhead Seal Drum, to include inspection for Wet H2S damage. Chevron has completed an external Automatic Ultrasonic Testing (AUT) inspection of representative sections of the "water wet" portions of V-1100, V-1160, and V-1190 vessels. Records demonstrating completion of this condition were reviewed by CCHS in May 2018. Post-modernization AUT inspections of V-1100, V-1190, and V-1160 were completed in first quarter 2020. A one-time internal inspection of each vessel was completed in June and July of 2022 CCHS reviewed the records demonstrating compliance with this measure in September of 2022.

7. Chevron has developed and implemented the following process monitoring and sampling plans in the Crude Unit overhead to observe impacts of increased sulfur levels post-startup of the Modernization Project. Records demonstrating completion of this condition were reviewed by CCHS in May 2018.

   - The Crude Unit atmospheric column overhead accumulator, V-1100, is sampled for pH, chlorides, iron, and H2S (sulfides) which are recorded and monitored in the Crude Unit Process Monitoring and Optimization (PMO) workbook. In addition, IOWs are currently in place for these parameters.
   - The Crude Unit desalter, V-1102, is monitored for pH pursuant to a contract with Nalco, a specialty chemicals contractor, reported to the Crude Unit Process Engineer and other unit personnel on a periodic basis, and discussed as needed monthly in the Unit Reliability Brief (URB) meetings. URB meetings are attended by Area Business Unit management and subject matter experts in the areas of reliability and operations to review reliability topics relative to current operation.
   - Measuring H2S (sulfides) in the water of V-1100 and monitoring in the PMO workbook will allow Chevron to analyze the atmospheric tower post-Modernization to quantify if there is increased H2S in the overhead system.
   - Pursuant to condition III.C10, Chevron conducted a historical review of mercaptan in jet cuts of crude and crude blends to establish flags in the crude acceptance tool. The refinery's crude acceptance tool includes flags in the jet cut for high mercaptans. If a flag is reached, Materials Engineering reviews the asset integrity plan and consider the potential for increased corrosion. While this condition references a "kerosene

cut," the Refinery's Crude Unit does not produce kerosene and no "kerosene cut" was identified in the Environmental Impact Report (EIR).

- The asset integrity plan for the Crude Unit identifies the locations of the Permasense® probes installed pursuant to condition III.B. The data collected from these probes is considered as part of Chevron's review of the asset integrity plan per MFG 525.

8. Chevron currently has the following controls and processes to assure carbon steel piping components downstream of high sulfur streams operating > 500F are not inadvertently placed into continuous service. Records demonstrating implementation of this condition were reviewed by CCHS in May 2018.

    - Manufacturing 520 (or MFG 520), Damage Mechanism Review Instruction, sets forth work processes to identify applicable damage mechanisms per equipment and piping class metallurgy. This standard incorporates industry practices and recommendations including API Recommended Practice 571, Damage Mechanisms Affecting Fixed Equipment in the Refinery Industry and API Recommended Practice 584, Integrity Operating Windows.
    - Manufacturing 525 (or MFG 525), Fixed Equipment Asset Strategies Standard sets expectations for asset strategies designed to prevent and mitigate losses of containment in fixed equipment and describes the process for creating and maintaining these strategies.
    - Refinery Instruction, RI-302, Color Identification and Labeling of Equipment and Pipelines, requires all drop out spools and temporary piping to be painted with purpose-colored bands for easy identification.
    - One of the Phase 4 deliverables in the IMPACT process is the development of the Temporary Connections List. Each item on the list is also tracked on the turnaround blind list and the Quality Control database to ensure removal prior to startup after a maintenance turnaround event. Chevron utilizes the IMPACT process to schedule, plan, and execute maintenance activities for planned maintenance turnaround events for each process unit.
    - Refinery Instruction, RI-370, Management of Change, requires an MOC be reviewed by appropriate subject matter experts when any type of metallurgy change is requested.

9. In 2017, Chevron conducted a 10-year historical review of purchased crudes and processed crude blends. Maximum mercaptan concentrations for jet cuts were calculated for the representative year of 2016. A review of the Permasense® data for the historical periods of time when these maximum concentrations were exceeded noted no increases in corrosion rates. As a result of this analysis, Chevron elected to incorporate a mercaptan flag for jet cut into its crude acceptance tool which would trigger an MOC action item to perform a lookback on the period of time where higher mercaptans in jet cut were processed. The MOC action item specifies that the Materials Engineer complete a review of the Permasense® data for the period of time. This is recorded in an MOC addendum called the "MOC for Crude Review [Required for RMP Compliance

Plan]." Records are attached to the MOC. Records were reviewed by CCHS in May 2018, August 2018, and June 2020.

10. The Crude Unit atmospheric overhead piping was metallurgically upgraded in 4Q 2016, so that all piping is now either Hastelloy clad/overlay or solid Hastelloy, from the outlet of C-1100 to the inlet of E-1101s.

    The other piping circuit in the Crude Unit having a dissimilar metal interface (similar to that of the overhead line prior to the upgrade), is the transfer line from the atmospheric furnace to the atmospheric column. This piping has an interface between 316 SS and 5CR as it heads towards the atmospheric column. The inspection plan for this circuit includes multiple CMLs immediately downstream of the interface in order to monitor for corrosion in that location.

    Records demonstrating completion of this condition were reviewed by CCHS in May 2018.

D. Hydroprocessing Recommendations

1. Chevron has committed to monitoring post-Project sulfur content of crudes being fed to the crude unit and uses 2.25% sulfur content of feed as a trigger to conduct a review of "inspections plans for the distillation section of the hydroprocessing units where sulfidation corrosion rates have been 'erratic' and uncertain, per API 939-C". This process assigns responsibilities across various organizations, including Strategic Planning, Oils Planning, Finance, Technical, and OE/PSM, and includes periodic checks by key process owners within these organizations. Since commencement of Project operations, average sulfur content of crude has not reached this trigger point.

2. Chevron has separately submitted a letter to the City pursuant to this requirement on August 3, 2017. Records demonstrating completion of this condition were reviewed by CCHS in May 2018. A copy of this report was included with the 2018 Reliability Program report.

3. Chevron has developed and implemented the process monitoring and sampling plans in the hydroprocessing units to observe applicable damage mechanisms as identified in the EIR post-startup of the Modernization Project. The hydroprocessing units implicated by this measure are: NHT, JHT, DHT, TKN, TKC, LNC, and HNC. Process conditions are monitored to adhere to equipment metallurgical limits with respect to ammonium bisulfide corrosion in the reactor effluent air coolers (REAC) of hydroprocessing units. These process conditions are monitored through the Refinery's IOW program.

   Process parameters which effect ammonium bisulfide corrosion include H2S partial pressure, ammonium bisulfide concentration, water dew point temperature upstream of wash water injection, water fluid phase of water at injection site, and fluid velocity downstream of wash water injection. Records demonstrating implementation of this condition were reviewed by CCHS in May 2018.

4. The integrity operating windows (IOWs) program has been implemented for critical hydroprocessing reliability variables such as the wash water rate for NH4HS corrosion control with IOW table, alarm and alert structure, corrective actions, required bypass mitigations, and training. Records demonstrating implementation of this condition were reviewed by CCHS in May 2018.

5. The REAC Corrosion Control Project was substantially completed during the 2014 TKN turnaround, resulting in extensive metallurgy upgrades. Current operations of certain TKN systems not modified by the Modernization Project are being managed per the HP-002 Reactor Effluent Air Cooler (REAC) Piping and Equipment Corrosion Control Guidelines (i.e., the "REAC best practice guidelines") through ongoing inspections to help ensure corrosion rates will remain under the REAC best practice guidelines and, if determined to be necessary, targeted upgrades during the next TKN turnaround. Records demonstrating completion of this condition were reviewed by CCHS in May 2018.

E. SDA Recommendations

1. A wet H2S inspection, using Surface Eddy Current techniques, was completed on SDA vessel V-2531 on July 3, 2019.

2. This condition requires that a water boot analysis of corrosive constituents be conducted in the SDA upon triggering 2.25 wt% and 2.75 wt% sulfur of crude oil processed at the Refinery. Chevron is monitoring crude sulfur content on a monthly basis and has implemented a Crude Sulfur Monitoring process that alerts Reliability Program task owners when crude sulfur triggers of 2.25 wt% or 2.75% are forecasted and reached. This process assigns responsibilities across various organizations, including Strategic Planning, Oils Planning, Finance, Technical, and OE/PSM, and includes periodic checks by key process owners within these organizations. Since commencement of Project operations, average sulfur content of crude has not reached this trigger point.

3. This obligation requires that predicted results be verified for the SDA when identified trigger points (2.25 wt% and 2.75 wt % sulfur) are reached. Chevron is monitoring crude sulfur content on a monthly basis and has implemented a Crude Sulfur Monitoring process that alerts Reliability Program task owners when crude sulfur triggers of 2.25 wt% or 2.75% are forecasted and reached. This process assigns responsibilities across various organizations, including Strategic Planning, Oils Planning, Finance, Technical, and OE/PSM, and includes periodic checks by key process owners within these organizations. Since commencement of Project operations, average sulfur content of crude has not reached this trigger point.

4. Chevron has scheduled a follow-up smart pig inspection of F-100 and F-120 furnace tubes for the first planned maintenance after the SDA has seen at least 1 year of post-Modernization Project operating conditions. Because the SDA turnaround occurred in 2Q2019, which is not in the timeframe that will reflect post-project operating conditions, this obligation will be completed during the next SDA turnaround.

5. The Refinery committed to the installation of 25 additional Permasense® monitors on carbon steel circuits in the Solvent De-Asphalter (SDA). Pursuant to letter dated July 31, 2018, Chevron requested the authority to install these monitors during its next scheduled SDA turnaround. The City approved this request on August 30, 2018. The monitors were successfully installed during the SDA turnaround and Chevron notified the City of the completion of installation on August 14, 2019. A copy of the City approval and notification of completion was included in the 2019 Report. CCHS reviewed records demonstrating completion of this condition in June 2020.

6. The integrity operating windows (IOWs) program for the SDA unit has been implemented consistent with API RP-584 for the identified damage mechanisms in the SDA unit as referenced in Appendix 4.13-REL with IOW table, alarm and alert structure, corrective actions, required bypass mitigations, and training. CCHS reviewed documents demonstrating implementation of this condition in May 2018.

7. Chevron has developed and implemented process monitoring and sampling plans for the SDA to observe applicable damage mechanisms as identified in the EIR post-startup of the Modernization Project. These plans include feed sulfur monitoring as well as sour water pH and sulfide content. Records demonstrating implementation of this condition were reviewed by CCHS in May 2018 and June 2020. Chevron continues post-modernization process monitoring and sampling.

F. Amine Systems Recommendation

Chevron continues to monitor amine loading and heat stable amine salts (HSAS) in the amine system to determine if post-Project amine loading and HSAS are impacted by any increase in H2S to the TKC Unit. Records demonstrating implementation of this condition were reviewed by CCHS in May 2018. Pre-project data was collected prior to commencement of Project operations and a comparison to post-project data was completed in third quarter 2020.

G. Sulfur Recovery Unit Recommendation

The new liquid and gaseous oxygen piping installed as part of the Richmond Modernization Project were designed consistent with applicable design codes. Chevron developed the asset strategy for the Chevron-owned/operated gaseous oxygen piping system downstream of the Pressure Control Skid and applied Chevron's Inspection Strategy for oxygen piping (IS-65). Prior to commissioning, all liquid and gaseous oxygen piping systems were cleaned according to Chevron's pre-commissioning cleaning work instruction, which are consistent with the Air Products instructions for commissioning cleaning. CCHS reviewed documents demonstrating implementation of this condition in March 2019 and June 2020.

H. Sour Gas System Recommendations

Chevron has developed its implementation strategy for the sour gas system recommendations which mature following commencement of Project operations. Chevron has completed reviews

and developed its Fixed Equipment Asset Strategies for each refinery process unit, including the sour gas systems. The development of these strategies followed Chevron's Manufacturing Standard (MFG-525) which is intended to prevent and mitigate loss of containment in fixed equipment, by identifying damage mechanisms, establishing IOWs, and prescribing inspection plans. Chevron intends to utilize this program implementation to meet the elements of this requirement.

1. This obligation requires a review of post-Project assumptions regarding ammonium bisulfide concentrations, dew points and potential for salt condensation in the sour gas piping if identified crude trigger points (2.25 wt% and 2.75 wt % average annual sulfur content) are reached. Chevron is monitoring crude sulfur content on a monthly basis, and has implemented a Crude Sulfur Monitoring process that alerts Reliability Program task owners when crude sulfur triggers of 2.25 wt% or 2.75% are forecasted and reached. This process assigns responsibilities across various organizations, including Strategic Planning, Oils Planning, Finance, Technical, and OE/PSM, and includes periodic checks by key process owners within these organizations. Since commencement of Project operations, average sulfur content of crude has not reached this trigger point.

2. The integrity operating windows (IOWs) program for the sour gas system has been implemented per API RP 584 for the identified damage mechanisms in the sour gas system as referenced in Appendix 4.13-REL with IOW table, alarm and alert structure, corrective actions, required bypass mitigations, and training. CCHS reviewed documents demonstrating implementation of this condition in May 2018.

I. <u>Sour Water System Recommendations</u>

1. Chevron completed a P&ID and Inspection Isometric level review of the existing inspections plans for the applicable sour water piping systems. Inspection plans were reviewed against applicable damage mechanisms as well as applicable Chevron standards, including HP-002 REAC Piping and Equipment Corrosion Control Guidelines to ensure appropriateness of CML placement and selected NDE methods. In addition, sour water piping within identified process units including WWT, TKC, TKN, LNC, HNC, and SWC, has been analyzed according to the Chevron Manufacturing Standard MFG-525 for Fixed Equipment Asset Strategies (FEAS). Inspection plans for these piping circuits were updated to align with the inspection strategy for ammonium bisulfide corrosion. CCHS reviewed records demonstrating compliance with this measure in August 2018 and June 2020.

2. This obligation requires that monitoring and sampling of ammonium bisulfide concentrations and velocities in the sour water piping and H2S concentrations in the H2S Stripper and NH3 Stripper overhead systems be conducted if identified crude trigger points (2.25 wt% and 2.75 wt % average annual sulfur content) are reached. Chevron is monitoring crude sulfur content on a monthly basis and has implemented a Crude Sulfur Monitoring process that alerts Reliability Program task owners when crude sulfur triggers of 2.25 wt% or 2.75% are forecasted and reached. This process assigns responsibilities across various organizations, including Strategic Planning, Oils Planning, Finance,

Technical, and OE/PSM, and includes periodic checks by key process owners within these organizations. Since commencement of Project operations, average sulfur content of crude has not reached this trigger point.

3. The Wet H2S program categorization for the H2S stripper, NH3 stripper, ammonia stripper overhead condenser, and ammonia stripper reflux drum was re-evaluated by the plant Material Engineer in first quarter 2020. No changes to the categorization were warranted, and all equipment remains Category 2 Wet H2S vessels, per the Chevron Wet H2S Program, "Risk Management of Wet H2S, Amine, and Carbonate Cracking of Pressure Vessels in Process Plants."

4. Chevron is continuing existing inspection techniques for all the overhead piping from the NH3 stripper to the reflux drum regardless of metallurgy. CCHS reviewed records demonstrating compliance with this measure in August 2018.

5. The integrity operating windows (IOWs) program for the sour water system has been implemented per API RP 584 for the identified damage mechanisms in the sour water system as referenced in Appendix 4.13-REL with IOW table, alarm and alert structure, corrective actions, required bypass mitigations, and training. CCHS reviewed documents demonstrating implementation of this condition in May 2018.

J. Recovered Oil Recommendations

Chevron reviewed CML locations at the C-710 injection nozzle and adjacent C-710 tower shell. Chevron utilized existing CML locations on the C-710 injection nozzle and modified CML locations on the C-710 tower shell. These changes have been implemented to inform inspections post-Project startup. CCHS reviewed records demonstrating compliance with this measure in May 2018.

IV. Ongoing Regulatory Review and Reporting

A. Re-evaluate and Report Post-Project Operating Assumptions from Reliability Review

Chevron is monitoring crude sulfur content on a monthly basis and has implemented a Crude Sulfur Monitoring process that alerts Reliability Program task owners when crude sulfur triggers of 2.25 wt% or 2.75 wt% are forecasted and reached. This process assigns responsibilities across various organizations, including Strategic Planning, Oils Planning, Finance, Technical, and OE/PSM, and includes periodic checks by key process owners within these organizations. Since commencement of Project operations, average sulfur content of crude has not reached this trigger point.

B. Report Inspection Results for Identified Circuits in Service Susceptible to High-Temperature Sulfidation Corrosion and other Damage Mechanisms Effected by the Project

The first and second IV.B Annual Reports summarizing monitoring and inspections results for all piping circuits in service susceptible to high temperature sulfidation corrosion, including those pursuant to III.A was submitted with the 2019 and 2020 Annual Reliability Program Reports. The third IV.B Annual Report is included in this Annual Reliability Program Report, as Attachment RP-4.

C. Process Hazard Analyses (PHA) Revalidation

Chevron has completed pre-construction Process Hazard Analyses (PHAs) inclusive of inherently safer systems analyses (ISSAs), damage mechanism reviews (DMRs) and layers of protection analyses (LOPAs) for Modernization Project components which were reviewed by CCHS in August 2016. Reviews and updates were made to PHAs, ISSAs, DMRs and LOPAs for the New Hydrogen Plant, Sulfur Removal Improvements to the FCC FHT (also referred to as the TKC). Modifications to the Sulfur Recovery Units (SRU), New No. 6 H2S Plant, and Hydrogen Compressor Upgrade Project (HYCUP) were made in 2018 and reviewed by CCHS in August 2018. Chevron completed a post-project PHA for the New Hydrogen Plant in 2020.

D. Share Schedule for and Report Results of Process Hazard Analyses (PHAs) Considering Damage Mechanisms

Chevron separately submitted a report pursuant to this requirement on December 29, 2022 as Transmittal #23_6 - Reliability Program IV_D Annual Report. The submittal is included as Attachment RP-5 of this report.

The next report will be submitted on or before December 31, 2023.

E. Updated Safety Program List

A list of programs, procedures, and other Refinery documentation used to implement this Reliability Program, or the corrective actions described in Section II has been updated. Chevron maintains this list at the Refinery and will make it available to the County during audits, inspections, or upon request.

F. Other Reporting Obligations

1. Probation Terms Reporting

Pursuant to the conditions of probation, the probationary period ended in February 2017. During the probationary period, Chevron did not receive any notices from the State or Cal/OSHA that Chevron was in violation of any term of probation. Therefore, no further annual reports are necessary. CCHS verified compliance with this measure in May 2018.

2. RISO Audits

A report summarizing 2022 (post-commencement of project operations) agency-related audits performed pursuant to the Richmond Industrial Safety Ordinance is included in this Reliability Program Report as Attachment RP-6.

G. Community Engagement

On December 21, 2021, the City and Chevron agreed that no community or workforce townhall would be required in 2022. See Attachment RP-7.

H. Reporting Obligation

This annual Reliability Program Report has been prepared to provide the status of all requirements of this Reliability Program. This report is being submitted to meet the annual reporting obligation. Subsequent reports will continue to be submitted annually.

Attachments
Attachment RP-1. Modernization Project Reliability Program
Attachment RP-2. Reliability Program-Related CUP and MMRP Commitments
Attachment RP-3. Reliability Program Implementation of General Recommendations
Attachment RP-4. Reliability Program Report IV.B
Attachment RP-5. Reliability Program Update for Condition IV.D
Attachment RP-6. Reliability Program Report IV.F.2
Attachment RP-7. Reliability Program Update for Condition IV.G

ATTACHMENT 1
Modernization Project Reliability Program

Modernization Project Reliability Program

Richmond Refinery

2014 Revision

MODERNIZATION PROJECT RELIABILITY PROGRAM

I. INTRODUCTION

Chevron U.S.A. Inc. ("Chevron") has proposed this Reliability Program ("Program") to mitigate potentially significant effects to public safety that might arise from implementation of the Modernization Project at Chevron's Richmond Refinery. Among other things, the Modernization Project would increase the Facility's sulfur removal capacity from 600 to 900 long tons per day (LT/d), which has the potential to increase the sulfur level of crude oil blends and gas oils processed by the Refinery. Sulfur is a naturally occurring element in crude and must be removed to produce the end-products processed at the Refinery. The processing of sulfur can lead to corrosion ("sulfidation corrosion") of piping and equipment, and must be effectively monitored and managed. Sulfidation corrosion is identified as a damage mechanism by *American Petroleum Institute (API) Recommended Practice 571 – Damage Mechanisms Affecting Fixed Equipment in the Refining Industry*.

The Project would increase the sulfur content of crude oil blends and gas oils processed at the Refinery. Therefore, the City of Richmond, with technical support from an independent expert retained by the City and Chevron, undertook a Reliability Analysis to assess the potential for increased risk of damage occurring from the physical, operational, and feedstock changes proposed as part of the Project, including from sulfidation corrosion, and makes recommendations on steps to be taken to mitigate the risks from these changes. The results of this Reliability Analysis are presented in the Modernization Project Environmental Impact Report (EIR), *Appendix 4.13 – Reliability Analysis of Modernization Project Changes* (Reliability Analysis).

The Reliability Analysis makes several general observations and recommendations concerning the Refinery's overall mechanical integrity program, as well as specific recommendations to monitor and address the potential effects of the Project. Section II of this Program generally describes the actions the Refinery is in the process of implementing to enhance its mechanical-integrity program and overall Refinery safety, which Chevron believes address the general recommendations from the Reliability Analysis.[1] Section III of this Program sets forth the Project-specific recommendations that will be implemented as a result of the Reliability Analysis. Section IV of the Program describes the ongoing regulatory review and reporting obligations committed to in this Program that will ensure that the actions identified in this Program is implemented.

II. GENERAL RECOMMENDATIONS AND REFINERY ACTIONS TO ADDRESS

The Reliability Analysis includes the following five general recommendations (*Appendix 4.13, pp. 123-124*):

[1] While these actions are being developed and implemented throughout Chevron U.S.A. Inc.'s refining system, the discussion focuses primarily on development and implementation at the Richmond refinery.

- ***Recommendation:*** Chevron should ensure that its organizational communication procedures and work processes incorporate mechanisms by which risk concerns, corrective actions, and recommendations that are identified (e.g., during inspections, turnarounds, audits, PHAs, etc.) by personnel (or contractors) are addressed, reviewed and authorized by management as appropriate, tracked, and closed out, and that the rationale for any decision not to implement a recommendation or corrective action, or otherwise address a risk concern, are clearly documented.

- ***Recommendation:*** Chevron should further clarify and incorporate into their mechanical integrity program and program documents periodic reviews of work processes, procedures, inspection strategies, etc. to account for physical, operational and organizational changes over time that could affect the assumptions that went into the original decisions. Examples that illustrate this include: (1) periodic reviews of inspection CML densities and placements to ensure that unpredictable damage mechanisms can be detected and (2) reviews of wet H2S damage risk, based on crude feed constituent changes. Chevron reports that it is developing "asset strategy plans" for each process unit, and that the development of the asset strategy plans will address this recommendation by including review of inspection procedures, working documents, CMLs, and damage mechanisms, and that the asset strategy plans will identify and implement changes needed to each as a result of the review. Whether called an "asset strategy plan" or otherwise included in another safety program (e.g., included as part of the Richmond Industrial Safety Ordinance documentation), Chevron should clarify its implementation tracking process for changes needed as a result of these periodic reviews.

- ***Recommendation:*** Chevron should leverage its existing infrastructure and technology to lessen the reliance on human interaction in responding to potential risks, including for example Chevron's current pilot project to implement Integrity Operating Windows per the guidelines of the draft API 584 Recommended Practice for the crude unit. Chevron should extend the pilot project to the remaining operating units.

- ***Recommendation:*** Chevron should review their Positive Material Identification (PMI) Procedure for compliance with API 578, *Material Verification Program for New and Existing Alloy Piping Systems***,** based on PMI inspection of equipment and piping during shutdown/ dismantling/disassembly**,** and make revisions, as warranted, to ensure that Chevron's PMI Procedure conforms to API 578.

- ***Recommendation:*** Chevron should review and modify their Piping Inspection Procedure to incorporate an engineering review of thickness inspection data with near term “Flag” dates for high risk equipment/piping to assure that the actual minimum thickness associated with the Flag date has either been verified through inspection or, alternatively, the inspection data analyzed with techniques such as a statistical analysis (95% CL or extreme value analysis) to evaluate what risk is involved if the actual minimum thickness was not measured.

Regarding the general recommendations, the Refinery is already implementing numerous actions to enhance safety, resulting in new or improved process safety work processes. Changes have

also been made in the reliability organization to provide more mechanical integrity oversight. Chevron believes these and other actions, described in detail in the EIR, *Chapter 4.13 – Public Safety, § 4.13.2.4.3.2.2*[2]*,* generally address these recommendations.

For example, the first recommendation calls for Chevron to ensure its organizational communication procedures and work processes adequately identify, track, and close out concerns and recommendations regarding risk. The Refinery is already taking the following actions to enhance organizational communication and competency concerning general and specific mechanical-integrity related recommendations:

- Developing and implementing a new process for additional oversight of general mechanical-integrity related recommendations from industry, Chevron's Energy Technology Company, and other subject matter experts.
- Development and deployment of an Integrity Threat Process to address inspection recommendations for equipment and piping that could significantly impact safety, or environmental or plant operations, including tracking recommendations by target completion date using the refinery's MERIDIUM and OERI databases until it is resolved.
- Updating its internal work instructions in 2013 to address inspection results that indicate that equipment or piping will reach "flag" or "alert" thickness prior to the next scheduled turnaround and to include immediate notification of any field measures that that indicate a remaining life of one year or less. This update also addresses the last general recommendation above to review and modify the piping inspection procedures.
- Enhancing the requirements for training and competency for leadership, inspections, and technical assessments, including specifically training for determining minimum thickness and fitness for service of individual piping components.
- With regard to turnaround planning, tracking and documenting any decision to defer or not to implement a fixed equipment inspection recommendation to approval by the Refinery Business Manager for the process unit for which the recommendation was made.

Further, the second and third general recommendations provide that Chevron should clarify and modify its mechanical integrity program to, among other things, consider physical, operational and organizational changes over time, and to leverage its existing infrastructure and technology to lessen the reliance on human interaction in responding to potential risks. The Refinery is already implementing enhancements to its mechanical-integrity program. For example:

- The Refinery has added a Fixed Equipment Integrity Manager, who is responsible for developing, implementing, and stewarding the refinery's Fixed Equipment Integrity program with a goal of achieving zero process safety incidents and improving mechanical availability.
- The Refinery has developed and piloted in its crude unit a Damage Mechanism Review (DMR) process that is consistent with *API 571* and which requires a team of subject

[2] While these actions are being developed and implemented throughout Chevron U.S.A. Inc.'s refining system, the discussion focuses primarily on development and implementation at the Richmond refinery.

matter experts to review, analyze, and make recommendations concerning damage mechanisms and how to mitigate the effects of damage mechanisms on each process unit. This process has now been made a required element in the Process Safety Management (PSM) process at the refinery for identified process units, and is being undertaken on an ongoing basis.

- The Refinery has piloted in its crude unit a process to create and utilize asset strategy plans for each process unit at the piping circuit level, which will be integrated into the DMR process and will include, among other things, integrity operating windows consistent with draft *API 584 – Integrity Operating Windows* and consideration of process conditions, inspections techniques and frequency, mixing and injection points, and corrosion monitoring locations (CML). These asset strategy plans will be implemented for all processing units on an ongoing basis.

The Refinery reports the status of the above-identified actions to CalOSHA as part of the August 5, 2013 terms of probation described in *Chapter 4.13 – Public Safety* of the environmental impact report, and has also committed to providing quarterly updates to the City pursuant to Mitigation Measure 4.13-CUM-1d. As part of this process, Chevron will work with the County, the City, and its consultants, to ensure that the above-stated general recommendations from the Reliability Analysis have been addressed.

In addition, Chevron will undertake a review of its Positive Material Identification (PMI) Procedure for compliance with API 578, *Material Verification Program for New and Existing Alloy Piping Systems***,** based on PMI inspection of equipment and piping during shutdown/ dismantling/disassembly**,** and make revisions, as warranted, to ensure that Chevron's PMI Procedure conforms to API 578.

III. PROJECT RECOMMENDATIONS

The enhanced safety measures described above will provide the foundation for the management of damage mechanisms in the refinery, including sulfidation corrosion, on a go-forward basis. In particular, the damage mechanism review process, the updated PHA process, and development and deployment the asset strategy plans, including integrity operating windows, will be used post-Project for all refinery units to manage risks from all damage mechanisms. In addition to this process, which provides for ongoing evaluation of risks and resulting recommendations, the Reliability Analysis has identified numerous Project-specific recommendations, which Chevron is committing to implement as part of this Reliability Program.

In order to identify Project-related recommendations, the Reliability Analysis assumed certain post-Project operating conditions. The assumptions and analytical method are described more fully in the EIR, Appendix 4.13-REL. The recommendations below, including piping circuit upgrades and installation of additional corrosion monitoring equipment, are tiered to this analysis, meaning that these measures will be implemented well before they would be triggered by actual projected post-Project operations.

A. Schedule and Report on Upgrades to Identified Piping Circuits

The Reliability Analysis for the Modernization Project has identified seventeen (17) piping circuits in the Crude Unit that warrant replacement based on the Reliability Analysis. The Refinery has committed to accelerating the replacement of these circuits during the next scheduled turnaround for the Crude Unit, no later than end-of-year (EOY) 2017, as follows:

Equipment number	Equipment description	Existing Metallurgy	New Material	Replacement Date
0955-002-008	V-1103 Desalted Crude	CS	9 Chrome	EOY 2017
0955-002-014	V-1103 Desalted Crude	CS	9 Chrome	EOY 2017
0955-002-015	V-1103 Desalted Crude	CS	9 Chrome	EOY 2017
0955-002-016	V-1103 Desalted Crude	CS	9 Chrome	EOY 2017
0955-002-017	V-1103 Desalted Crude	CS	9 Chrome	EOY 2017
0955-002-018	V-1103 Desalted Crude	CS	9 Chrome	EOY 2017
0955-002-030	Desalted Crude From E-1165A To F-1100A/B	CS	9 Chrome	EOY 2017
0955-002-031	Desalted Crude From E-1165B To F-1100A/B	CS	9 Chrome	EOY 2017
0955-002-032	Desalted Crude From E-1116's to E-1165C	CS	9 Chrome	EOY 2017
0955-007-009	#4 Sidecut Circ Reflux	CS	9 Chrome	EOY 2017
0955-007-017	#4 Sidecut Circ Reflux	CS	9 Chrome	EOY 2017
0955-009-003	C-1100 Bottoms to F-1160	5Cr	9 Chrome	EOY 2017
0955-012-001	C-1160 Outlet #7 Sidecut	CS	9 Chrome	EOY 2017
0955-012-002	#7 Sidecut	CS	9 Chrome	EOY 2017
0955-013-007	C-1160 OUTLET: #8 Sidecut to E-1188	CS	9 Chrome	EOY 2017
0955-013-008	C-1160 Outlet: #8 Sidecut to C-1160	CS	9 Chrome	EOY 2017
0955-013-009	C-1160 Outlet: #8 Sidecut to E-1114	CS	9 Chrome	EOY 2017

The Reliability Analysis for the Modernization Project has also identified four partial piping and valve replacements in the Crude Unit that warrant replacement based on reasonably foreseeable post-Project operating conditions. The Refinery has committed to accelerating the replacement of these partial components during the next scheduled turnaround for the Crude Unit, no later than end-of-year (EOY) 2017, as follows:

Equipment number	Equipment description	Existing Metallurgy	New Material	Replacement Date
0955-015-002	C-1160 OUTLET to E-1165 A/B/C	9Cr/5Cr/ (2) 10" spool piece and drain valves CS	Replace 5Cr and CS with 9CR; existing 9Cr remains in place	EOY 2017
0955-015-017	K-1165A/B Pump Out	9Cr/5Cr/CS	Replace short 5Cr deadleg immediately off filters with 9 Cr. CS is either free-draining, isolated, or cool wash oil service, so no need to replace because do not see regular service	EOY 2017
0955-019-034	P-1165/A Case Vents to C-1160	SS/CS	CS is downstream of single SS block valve. Upgrade the 3/4" CS pump case vents with SS to double block and bleed design.	EOY 2017
0955-019-017	Pump Vents	9Cr/5Cr/CS	Replace 5Cr with 9Cr and add a second block valve and bleeder. CS component is downstream of 5Cr single block valve; no project impact on CS portion downstream of the valve.	EOY 2017

Chevron shall obtain all required permits for replacement of these piping circuits pursuant to the California Building Standards Code, inclusive of the California Fire Code, and, once the piping circuits are replaced, shall submit copies of closed permits to the Planning Department to demonstrate compliance with this commitment.

B. Installation and Monitoring of Additional Permasense® Monitors on Identified Circuits

Since the beginning of 2013, the Refinery has installed a total of 117 Permasense® probes in theCrude Unit on six piping systems consisting of carbon steel, 5 Chrome, and 9 Chrome materials. Permasense® is the trade name of a type of high-temperature ultrasonic device that is mounted on a pipe or vessel, and penetrates through insulation. It has wireless sensors that provide periodic equipment thickness readings (at variable intervals, but currently set to collect thickness data twice a day) to monitor a system. Due to noise and sensitivity, the technology is limited to longer-term trending (days and months vs. hours) which is appropriate for piping subject to sulfidation conditions with its predictable rates.

The six piping circuits on which the sensors were installed were chosen based on past and anticipated projected future operating conditions. The wireless probes collect pipe wall thickness data while the plant is operating, and are used to monitor corrosion rates. This long-term online monitoring program will be part of the reliability program to ensure safe operation of equipment after the Modernization Project commences operations. Thirteen of these piping circuits with Permasense® monitors installed have been identified for replacement and will be upgraded to 9 Chrome pursuant to the piping circuit upgrades planned as a part of this Reliability Program and the Permasense® monitors will not be reinstalled on these circuits. In addition, as part of the Project, the Refinery will install at least 25 additional Permasense® monitors on carbon steel circuits in the Solvent De-Asphalter (SDA). These sensors are being installed to confirm the predictive model results that there will be little-to-no sulfidation corrosion in the SDA post-Project.

Data from the Permasense® monitors will be utilized in the reporting obligations set forth in section IV below.

C. Crude Unit Recommendations

The operational and feedstock changes contemplated by the Modernization Project, specifically increases in sulfur content of feedstocks, increased hydrogen purity produced by the new hydrogen plant, increased H_2S partial pressures in hydroprocessing plants recycle streams, or potentially higher temperatures in the crude unit based on API gravity ratings, could all contribute to increased damage mechanism activity post-Modernization Project, thereby warranting the implementation of the following preventive measures.

1. Based on the marginal results from the F-1100 radiant tube sulfidation analysis, Chevron should monitor the post-Modernization Project sulfur content being fed to the crude unit and use a 2.0 wt.% sulfur content of feed as a trigger to conduct a review of the F-1100 crude charge furnace to study whether the 5 Chrome radiant tubes are safe to operate until the 2017 shutdown.

2. Chevron's analysis of the atmospheric column furnace F-1100 does not include conclusive evidence as to the present creep/stress-rupture condition of the tubes. Therefore, it is believed that some additional actions are required in order to lower the risk of a creep/stress-rupture or sulfidation failure in a F-1100 tube under post-Modernization Project operating conditions. Acceptable options to lower the risk of heater tube failures include:

   - Furnace F-1100: Option 1, complete all of the following actions:
     - Complete a full internal tube inspection for F-1100 during the 4th quarter 2017 crude unit turnaround using intelligent pigs.
     - Conduct testing on the two currently available, radiant section tubes from the F-1100 Furnace to verify their existing metallurgical, physical and mechanical properties, plus remaining creep life using accelerated Omega creep testing as an input to decide whether the F-1100 furnace should be retubed during the 2017 shutdown.
     - Conduct additional metallurgical, physical, mechanical and Omega creep testing on radiant furnace tube samples to be removed during the 2017 shutdown, depending on the results of the Omega testing planned for the 2012 furnace tube samples.
     - In 2017, replace tubes as needed in F-1100, per Chevron's replacement criteria for furnace tubes. The replacement criteria are based on the minimum furnace tube thickness on the furnace Safety Instruction Sheet and remaining wall thickness collected by intelligent pig data.
     - Install at least three Permasense® continuous monitoring ultrasonic thickness gauge monitors in each of the furnace outlet systems. If the monitors indicate an increase in corrosion rates greater than 5 mpy, review the need for additional mitigation actions.

   - Furnace F-1100: Option 2:
     - Retube the F-1100A/B furnace during the 2017 turnaround with 9Cr or higher alloy tubes.

3. The vacuum column furnace, F-1160, is constructed of 5Cr radiant furnace tubes. The recommended actions for this furnace are as follows:

   - Complete a full internal tube inspection for F-1160 during the 2017 crude unit turnaround using intelligent pigs.
   - In 2017, replace tubes as needed in F-1160 per Chevron's replacement criteria for furnace tubes. The replacement criteria are based on the minimum furnace tube thickness on the furnace Safety Instruction Sheet and remaining wall thickness collected by intelligent pig data.

4. Conduct laboratory analyses to more accurately determine crude and crude blend sulfur speciation and H2S evolution, which could be used to predict likely crude corrosion rates. Timing: 4Q2015

5. Develop integrity operating windows (IOWs) for critical crude unit operating parameters per the guidelines in the draft version of API 584. 3Q2014
6. The Crude Splitter software is used to predict the distribution of the sulfur in the atmospheric tower sidecut and bottom streams. Verify the Crude Splitter predicted sulfur results with post-Modernization data on the sulfur containing streams within the first year of operation following the implementation of the Modernization project if the trigger points (2.25 wt.% sulfur and 2.75 wt. % sulfur) noted in § IV.A below are reached.
7. Revise the asset integrity plans for the Crude Unit Atmospheric Column Reflux Drum, V-1100, the Stabilizer Column Reflux Drum, V-1190, and the Vacuum Column Overhead Seal Drum, V-1160, to include inspection for Wet H2S damage. An external Automatic Ultrasonic Testing inspection of representative sections of the "water wet" portions of V-1100, V-1160 and V-1190 vessels should be conducted as a baseline before the start of post-Modernization conditions, then checked externally again approximately one year after the start of the Modernization conditions. In addition, a one-time internal inspection should be conducted of the these vessels during the scheduled maintenance turnaround after the start of Modernization conditions, using eddy current or other approved internal inspection techniques per the Chevron Wet H2S program.
8. Develop a process monitoring plan for the crude unit overhead to confirm any impacts of the increased sulfur levels. The monitoring plan should be implemented post-Modernization and should include:

    - Process sampling of the accumulator for pH, chlorides, iron and H_2S content. Compare to established integrity operating windows (IOWs);
    - Monitor Desalter pH;
    - Analyze the atmospheric tower post-Modernization to quantify if, and how much, increased H_2S is in the overhead system resulting from the increased sulfur feed to the unit;
    - Higher mercaptan crudes could lead to increased sulfidation corrosion rates in the jet or kerosene cuts. Modify asset integrity plans to monitor for potential increased corrosion if higher mercaptan crudes are run compared with current and historical crude and crude blends; and
    - Review the asset integrity plan to ensure that the Permasense continuous ultrasonic monitoring locations are properly placed to ensure early detection should corrosion rates increase significantly beyond expectations per the McConomy curve predicted rates.

9. Develop and implement physical or administrative controls to assure that carbon steel piping components downstream of high sulfur streams operating > 500F are not inadvertently placed into continuous (e.g., placement of a warning tag, locked valve, double-block-and-bleed valves or other measures). This should be completed prior to the commencement of Modernization Project operations.
10. Higher mercaptan crudes could lead to increased sulfidation corrosion rates in the jet or kerosene cuts. Conduct a historical review of purchased crudes and processed crude blends for the 90% confidence level of highest mercaptans processed and use

this statistical number to set a review flag in the crude and gas oil acceptance procedure. If higher mercaptans crudes are run at the Richmond Refinery, review the Permasense® corrosion rate data from this time period as part of the crude management of change lookback. This should be completed prior to the commencement of Modernization Project operations.

11. Add corrosion monitoring locations (CMLs) to the crude unit atmospheric column overhead piping (circuit 0955-003-001) at the termination of the Hastelloy internal overlay. This should include the termination of cladding in the vertical section of piping, as well as the termination point at the inlet to the E- 1101's. Review other, similar locations in the crude unit for missing dissimilar metal interface thickness monitoring locations (TMLs). This should be completed prior to the commencement of Modernization Project operations.

D. Hydroprocessing Recommendations

1. At the 2.25% wt. % sulfur in crude feed trigger point, evaluate and modify as warranted, based on any increased sulfur in this section of the unit, inspection plans (what, where and how often) for the distillation section of the hydroprocessing units where sulfidation corrosion rates have been "erratic" and uncertain, per API 939-C.
2. Report on the progress of the project to compare the HP-002 Best Practice Guideline regarding water wash to API 932-B recommendations to ensure that the HP-002 document is consistent with 932-B guidelines. This report should be submitted prior to the commencement of Modernization Project operations.
3. Conduct process monitoring and sampling for post-Modernization Project operations for all hydroprocessing units, to develop process data to confirm assumptions made during the damage mechanism review regarding amounts of H2S and ammonium bisulfide in the overhead systems. This shall be completed after commencement of Modernization Project operations.
4. Develop integrity operating windows (IOWs) for the hydroprocessing units to incorporate existing critical reliability variables such as the wash water rate for Nh4HS corrosion control. The IOWs shall be established prior to the startup of Modernization Project operations.
5. If the REAC Corrosion Control Project (TKN) is not completed pre-Modernization Project, conduct a review of current operations to ensure that corrosion rates will remain under REAC best practice guidelines with any increase in sulfur to the unit. This shall be completed prior to the startup of Modernization Project operations.

E. SDA Recommendations

1. Verify post-Modernization Project conditions regarding H_2S content in the SDA overheads and target one or more "water wet" vessels for inspection using internal eddy current, external automatic ultrasonics (AUT) or other non-destructive evaluation (NDE) techniques appropriate for wet H_2S cracking detection within one year of operation under post-Modernization Project conditions.
2. Conduct water boot analysis for corrosive constituents similar to that conducted in the crude unit on the unit overhead accumulator drums, including cyanides. This should

be conducted at the 2.25 wt.% and 2.75 wt. % sulfur trigger points identified in § IV.A below.

3. When the sulfur wt.% of crude oil processed at the Facility reaches 2.25 wt.% sulfur on an annual average, and the again when it reaches 2.75 wt.% sulfur annual average, the Facility shall trigger the same responses for the SDA plant as described in the recommendation section for the crude unit.
4. Conduct a follow-up smart pig inspection of F-100 and F-120 furnace tubes during the first planned maintenance after the unit has seen at least 1 year of post-Modernization Project operating conditions.
5. Install at least 25 additional Permasense® monitors on carbon steel circuits in the Solvent De-Asphalter (SDA) including sulfidation "dead legs," based on a critical review of historical corrosion rates. These sensors will confirm the predictive model results that there will be little-to-no increase in sulfidation corrosion in the SDA post-Modernization Project. These installations should be completed prior to the commencement of Modernization Project operations.
6. Develop integrity operating windows (IOWs) per draft API RP-584 for identified damage mechanisms in the SDA unit. The IOWs should be established prior to the commencement of Modernization Project operations.
7. Develop process monitoring and sampling plans for post-Modernization Project operating conditions to confirm assumptions made during the damage mechanism review project. The monitoring and sampling plans should be developed prior to the commencement of Modernization Project operations, and should be implemented after commencement of Project operations following an increase in sulfur content to the SDA unit.

F. Amine Systems Recommendations.

It is recommended that Chevron review ongoing sampling results (per Best Practice timing plus vendor sampling and reports) to determine if post-Modernization Project amine loading and heat stable amine salts (HSAS) are impacted by any increase in H_2S to the TKC Unit. This should be done prior to the commencement of Modernization Project operations.

G. Sulfur Recovery Unit Recommendations

Associated with the new liquid oxygen piping, the Facility shall typically design and build new construction in conformance with the special design and installation precautions associated with oxygen piping systems, i.e., design and installation best practice details common in industry for oxygen piping systems, including pre-commissioning cleaning of the piping interior to remove harmful materials such as dirt, debris, iron, grease and other contaminants known to cause ignition of pure liquid and gaseous oxygen.

H. Sour Gas System Recommendations

Based on the potential risk of ammonium bisulfide corrosion in carbon steel due to the possibility of the sour gas condensing at locally cool portions of piping, Chevron should develop and implement a mitigation plan for this eventuality. The mitigation plan is to

include reviewing sour gas P&IDs and isometric drawings to locate low points where water could accumulate, locate dead legs and establish inspection/monitoring plans for verifying if and where water is condensing out of the vapor phase. This should be conducted within 1 year of commencement of Modernization Project start-up.

1. Chevron should conduct a review to confirm their post-Modernization assumptions made during this review regarding ammonium bisulfide concentrations, dew points and potential for salt condensation in the sour gas piping, at the 2.25 wt. % and 2.75 wt. % average annual sulfur content trigger points.
2. Develop integrity operating windows (IOWs) per draft API RP-584 for identified damage mechanisms for the sour gas system. These IOWs should be established prior to the commencement of Modernization Project operations.

I. Sour Water System Recommendations

1. The block diagrams shown in Figure A4.13-REL-16 and Figure A4.13-REL-17do not include detailed information at the "P&ID" level. Also, information is lacking on the sour gas streams in the overhead of the H_2S and NH3 strippers in the SWS unit. (However, for purposes of the review the overhead systems of the WWT plants were deemed to be out of scope.) The impact of post-Modernization Project corrosion from sour water corrosion should be minimal, based on the Reviewer's analysis of the sour water streams. However, based on a lack of detail at the P&ID level Chevron should conduct a review of their sour water piping inspection programs at the P&ID/Inspection Isometric level (including to ensure that low points, galvanic metal couple locations and CMLs are properly captured) to ensure that their program is sufficient to detect any ammonium bisulfide corrosion in the system. This should be completed prior to the commencement of Modernization Project operations.
2. Chevron should be monitoring and sampling to confirm their assumptions regarding the ammonium bisulfide concentrations and velocities in the sour water piping and H2S concentrations in the H2S Stripper and NH3 Stripper overhead systems. This review should be conducted when average annual sulfur content levels reach 2.25 wt. % and again at 2.75 wt. %.
3. The H2S stripper, NH3 stripper, ammonia stripper overhead condenser, and ammonia stripper reflux drum are all Category 2 Wet H2S vessels and therefore are included in Chevron's wet H2S program. If a post-Modernization Project review of the assumptions regarding the severity of wet H2S damage in the overhead systems warrants a change in the categorization of the overhead wet H2S vessels, then a wet H2S cracking inspection should be conducted. This should be conducted within one year after the commencement of Modernization Project operations.
4. Continue as with the existing condition inspection, the X-ray and/or close-grid UT inspection techniques for all of the overhead piping from the NH3 stripper to the reflux drum regardless of metallurgy.
5. Develop integrity operating windows (IOWs) per draft API RP-584 for identified damage mechanisms for the sour water system. The IOWs should be established prior to the commencement of Modernization Project operations.

J. Recovered Oil Recommendations

If not already present, add CML locations to the C-710 injection nozzle and adjacent C-710 tower shell so that the assumptions regarding post-Modernization Project corrosion rates not increasing in severity can be verified. Implement prior to the operational startup of the Modernization Project.

IV. ONGOING REGULATORY REVIEW AND REPORTING

In order to demonstrate compliance with the recommendation above, as well as to provide the City regular update concerning the implementation of the corrective actions described in § II above, the Refinery will undertake the following reporting obligations.

A. Re-evaluate and Report on Post-Project Operating Assumptions from Reliability Review

The Reliability Analysis for the Modernization Project assumed certain operating conditions once the Project is implemented, including projected temperatures, sulfur levels, and corrosion rates for various process units and individual piping circuits. These assumptions were based on a conservative 3.3 wt% sulfur case. In order to verify that the assumptions made during the reliability review were accurate, the Refinery will undertake the following actions:

- When the sulfur weight percent of crude oil processed at the Refinery reaches 2.25 wt% sulfur on an annual average, and the again when it reaches 2.75 wt% sulfur annual average, the Refinery shall:

    - Assemble a reliability review team that will be made up of appropriate subject matter experts (SMEs), including a Senior Process Engineer, Senior ETC Materials and Corrosion Engineer, Refinery Materials Engineer and Process Operator.
    - For all damage mechanisms identified as being affected by the Project, and using then-current inspection and/or monitoring data, the reliability review team shall review, analyze, and, as necessary, update, the data and conclusions prepared during the reliability review for the Modernization Project to determine whether the assumptions made and conclusions reached during the reliability review accurately reflect actual post-Project operating conditions.
    - Use the data from the laboratory tests described above to consider any potential post-Project impacts from sulfur speciation.
    - Review any operational or process changes that have occurred post-Project.
    - Make recommendations concerning material upgrades and /or enhanced inspection opportunities as necessary based on the re-evaluation.
    - Report on the results of the this re-evaluation and any resulting recommendation to Contra Costa Health Services, the expert agency charged with implementing the Richmond Industrial Safety Ordinance, as well as one or more Refinery workforce representatives from any process units impacted by the re-evalualtion and recommendations and who shall have the necessary subject matter expertise to engage in a Project-level reliability review.

B. Report Inspection Results for Identified Circuits in Service Susceptible to High-Temperature Sulfidation Corrosion and other Damage Mechanisms Effected by the Project

All piping circuits in the Refinery, including the new 9 Chrome circuits being installed pursuant to § III.A of this Reliability Program, are regularly monitored and inspected. Beginning one year from commencement of Project operations, and annually thereafter, the Refinery will provide reports to the City summarizing the monitoring and inspection results for the identified circuits. These reports shall at a minimum include the following information:

- A list of all piping circuits identified as potentially susceptible to sulfidation corrosion, including specifically piping circuits identified during the reliability review for the Modernization Project as being susceptible to sulfidation corrosion and subject to potential process changes.
- A list of components identified through the 100% component inspection conducted following the August 6, 2012 incident pursuant to the methodologies set forth in the API 939-C - Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries and Updated Inspection Strategies for Preventing Sulfidation Corrosion Failures in Chevron Refineries (Sept. 30, 2009) that may lack sufficient thickness to remain in service until the next scheduled turnaround.
- A description of the solutions implemented with respect to components of insufficient thickness identified above.
- A description of the current fixed inspection frequency for carbon steel piping circuits identified as potentially susceptible to sulfidation corrosion.
- A description of any findings from inspection and monitoring of the piping circuits identified during the reliability review for the Modernization Project as being susceptible to sulfidation corrosion and subject to potential process changes that indicate that any of these circuits lack sufficient thickness to remain in service until the next turnaround and a description of the solution to be implemented with respect to these circuits.
- Chevron shall obtain all required permits for replacement of these piping circuits pursuant to the California Building Standards Code, inclusive of the California Fire Code, and, once the piping circuits are replaced, shall submit copies of closed permits to the Planning Department to demonstrate compliance with this commitment.

C. Process Hazard Analyses (PHA) Revalidation

Chevron shall work with Contra Costa Health Services (CCHS) to update and revalidate the process hazard analyses (PHA) prepared for the Project components consistent with the requirements of the Richmond Industrial Safety Ordinance (Richmond Municipal Code Ch. 6.43). This revalidation shall occur prior to commencement of Project construction, and again after construction but before startup of Project operations for any changes that may have arisen during construction that could affect the earlier PHA. The PHAs shall include inherently safer

systems analyses (ISSAs), damage mechanism reviews and evaluation of the consequences thereof resulting from the Project, and Layers of Protection Analyses (LOPA).

Chevron will notify CCHS and the City of the availability of these PHAs, and make these PHAs available for review by CCHS**.** The PHAs (initial and updates/revalidations, inherently safer systems analysis, damage mechanisms review, and LOPAs) shall be consistent with proposed amendments to the RISO. Chevron shall conduct the LOPAs and submit written LOPA reports, prepared in accordance with industry best practices (such as those issued by the Center for Chemical Process Safety (CCPS)) to CCHS for review prior to construction (and post-construction, for those LOPAs warranted based on changes that arise during construction).

D. Share Schedule for and Report Results of Process Hazard Analyses (PHAs) Considering Damage Mechanisms.

Chevron shall provide annual reports to the City summarizing the PHAs/revalidated PHAs completed during the preceding calendar year to account for consideration of damage mechanisms, and shall include a list of fixed equipment inspection recommendations submitted for each turnaround, indicating which recommendations were accepted, and for those that were not accepted, the reason the recommendation was rejected. All PHAs shall be available for agency review pursuant to the terms of the RISO.

E. Updated Safety Program List

Chevron shall maintain a list of programs, procedures, and/or other Refinery documentation that are updated to implement this Reliability Program or the corrective actions described in § II above. Chevron shall maintain this list at the Refinery and make it available to the County during audits, inspections, or upon request.

F. Other Reporting Obligations

1. Probation Terms Reporting

Prior to Project start-up, Chevron shall provide the City a status report on the refinery's compliance with the terms of probation entered into on August 5, 2013, and shall thereafter provide the City reports substantively similar to the reports filed with Cal/OSHA under the terms of probation once per year as necessary until such time as the terms of probation end, including a copy of any response documents provided by CalOSHA, or a detailed summary of any CalOSHA responses if CalOSHA does not approve sharing the response documents with the City. Chevron will work with CalOSHA to pursue their approval to share the Chevron CalOSHA response documents. The original reports and related documents shall be made available at the Refinery upon request by the City or County and during any audits or inspections conducted under the RISO.

2. RISO Audits

Following commencement of Project operations, Chevron shall provide the City an annual report informing the City of any agency-initiated audits performed pursuant to the Richmond Industrial Safety Ordinance during the previous calendar year, and shall update the City concerning the findings from and status of implementation of any recommendation that come out of such audits.

G. Community Engagement

On an annual basis following Project approval until such time as the City determines that such meetings are no longer required, Chevron shall hold town halls for its workforce and for the community to provide updates concerning:

1. The status of the enhanced safety measures being implemented by the Refinery following the August 6, 2012 fire, including actions taken to implement the recommendations made by public agencies that investigated the August 6 incident.
2. The status and/or results of the material upgrades, inspection and monitoring program, and ongoing compliance with the Richmond Industrial Safety Ordinance, including Project-related PHAs, DMRs, LOPAs, and ISSAs.
3. When triggered, the results of the reliability review revalidation and the status of any recommendations made as a result of this review.

H. Reporting Obligation

As part of its ongoing reporting obligation under the Mitigation Monitoring and Reporting Program adopted by the City, Chevron shall report on the status of all requirements of this Reliability Program on an annual basis in a form acceptable to the City. All reporting obligations herein shall be subject to the protection for trade secrets provided in Richmond Municipal Code § 6.43.110 and California Health and Safety Code section 25538 incorporated therein.

ATTACHMENT 2
Reliability Program-Related CUP and MMRP Commitments

Reliability Program Recommendations

Attachment RP-2. Reliability Program-Related CUP and MMRP Commitments

Section	Sub	Item	Description	Program Report 2022
			MMRP	
4	13	13f	Chevron shall designate a Facility Area Business Unit Manager as the management level position bearing responsibility for any and all decisions to not implement a recommendation made during an inspection or turnaround. Chevron shall also designate a Facility Area Business Unit Manager as the management level position bearing responsibility for the establishment of the parameters in the Integrity Operating Window program, as well as for any decisions to override, bypass, or otherwise disregard an alert or flag that arises through the Integrity Operating Window program. The annual Reliability Program reports shall include clear identification of the individuals acting as Area Business Unit Managers to whom these accountabilities have been assigned. If the management position bearing any of these responsibilities changes within Chevron from the Area Business Unit Manager to another management-level job title, Chevron shall notify the City and include an update to this effect in its Reliability Program annual report.	Chevron currently has the following controls and processes that designate the Facility Area Business Unit Manager (ABUM), now titled Refinery Business Manager (RBM), as the management level position bearing responsibility for decisions regarding recommendations made during an inspection or turnaround. • Manufacturing 530 (or MFG 530), Fixed Equipment Integrity Threat Recommendation and Resolution, establishes a process for identifying integrity threats and issuing recommendations, and developing associated resolution plans designed to prevent and mitigate loss of containment due to fixed equipment degradation. MFG 530 specifies that "Operations Management", which for the purposes of the Richmond Refinery is the RBM, has the role and responsibility to provide final approval on all business unit integrity threat resolution and mitigation plans and is accountable for ensuring resolution and mitigation activities are completed by due dates. • Further the Richmond Refinery Fixed Equipment Integrity Threat Recommendation Standard specifies that the RBM provides the final approval on all Business Unit Integrity Threat resolution and mitigation plans and is accountable for ensuring resolution and mitigation activities are completed by due dates. Chevron has the following controls and processes that address the Integrity Operating Windows (IOW) program and management. • Manufacturing 526 (or MFG 526), Integrity Operating Windows Standard, released in March 2019, establishes a process for the development and management of Integrity Operating Windows. The standard designates the RBM as the responsible position to approve any additions, changes, or deletions to the IOW program as well as how bypasses of IOWs are managed. Note, the RBM may also designate the Refinery Shift Leader (RSL) to approve how bypasses of IOWs are managed. The RBM may also rely on the Operating Assistant to manage the change management process for IOW-related changes. • Refinery Instruction, RI-372, Bypassing Critical Protections establishes the protocol which includes process control alarms including Safe Operating Limits (SOL) established by the IOW program. The instruction designates the RBM as the responsible person to approve implementation of the bypass. • As part of the monthly Unit Reliability Brief (URB) meetings, attended by the RBM and subject matter experts in the areas of reliability and operations, reliability topics, such as IOW alerts, are reviewed relative to current operation.
4	13	13h	Chevron shall establish Integrity Operating Windows (IOWs) to monitor process temperatures, for purposes of identifying process temperature increases above the baseline period (2008-2010) for any individual circuit affected by the Modernization Project (as indicated in the Reliability Analysis Appendix 4.13-REL). The IOW shall establish temperature "flags" for each temperature monitoring location based on industry-standard damage curves. Prior to implementation of the IOW temperature flags, Chevron shall provide information to the City and County regarding the flag trigger temperature levels and the basis for them, and provide the City and County an opportunity to review and comment on them before they are implemented. The IOW-2 temperature flag shall be triggered if the process temperature exceeds the established temperature for a cumulative 365 days, and shall require Chevron to perform a reliability analysis to evaluate, among other things, existing process conditions, flag dates for wall thickness, monitoring and inspection data, expected corrosion rates, metallurgy, existing damage mechanism reviews, and monitoring and inspection frequency. Chevron shall report the results of these reliability analyses in its annual Reliability Program report, and shall make process temperature data for all temperature monitoring locations within each process unit and circuit included in the Reliability Analysis (Appendix 4.13-REL) available for review by the City or County at the refinery. Chevron also shall include in its annual Reliability Program reports a listing of all events relating to process temperatures reaching levels that triggered an IOW-level 2 (defined by Chevron as a "slower acting event that requires technical evaluation and recommendations within one week") alert during the calendar year that is the subject of the annual report, as well as a description of the resolution of each such event. Chevron shall report to the City and County within one week of any IOW level 1 (defined by Chevron as a "fast acting event that requires operator action within a shift or two") alert event	Chevron has established Integrity Operating Windows (IOWs) which monitor process temperatures for the applicable damage mechanisms identified in the Reliability Analysis Appendix 4.13-REL which include sulfidation, high temperature sulfidation, and high temperature hydrogen attack for the applicable process units impacted by the Modernization Project. CCHS reviewed IOW tables establishing these temperature flags in May 2018. Since project operations began on April 17, 2019, IOW-level 1 alert events are reported to the City within one week, while IOW-level 2 alert events are tracked internally and listed in Exhibit A. No IOW-level 2 alert events have triggered the reliability analysis requirement (cumulative 365 days of exceeding established temperature flag).
4	13	4a	Chevron will implement its Modernization Project Reliability Program (Appendix 4.13-PROG) including updating the detailed PHAs prepared for the 2008 Project for all new and modified Modernization Project components, which shall include ISSAs, damage mechanism reviews, and evaluation of the consequences thereof resulting from the Project, and LOPA, as part of these PHAs, prior to recommencement of construction of the Modernization Project, and again post-construction but before startup of Project operations for any changes that arise during construction that may affect the earlier PHAs, ISSAs, and LOPAs. Chevron will notify CCHS and the City of the availability of these PHAs, and make these PHAs available for review by CCHS and the City. The PHAs (initial and updates/revalidations), ISSAs, damage mechanisms reviews, and LOPAs shall be consistent with (proposed) amendments to the RISO. Chevron shall conduct the LOPAs and submit written LOPA reports, prepared in accordance with industry best practices (such as those issued by the Center for Chemical Process Safety) to CCHS and the City for review prior to construction (and post-construction, for those LOPAs warranting changes based on changes that arise during construction). CCHS will work with the City in implementing	See response to IV.C of the Reliability Program Annual Report.

Reliability Program Recommendations

Attachment RP-2. Reliability Program-Related CUP and MMRP Commitments

Section	Sub	Item	Description	Program Report 2022
4	13	7a	Chevron shall implement the Modernization Project Reliability Program for all units and processes affected by the Modernization Project, including written reports specified in the Modernization Project Reliability Program. An initial Reliability Program report shall be submitted to the City and County prior to Project construction. Annual reports shall be submitted thereafter, including a report prior to commencement of Project operations. For the PHAs (initial and revalidations) specified in the Modernization Project Reliability Program, Chevron would complete the PHAs prior to commencement of Project construction, and again after construction but before startup of Project operations for any changes that may have arisen during construction that could affect the earlier PHAs. Chevron will thereafter update and revalidate PHAs in accordance with the RISO but not less than once every 5 years. As indicated in Mitigation Measure 4.13-4a, the PHAs shall include LOPAs, and written LOPA reports must be submitted to the County prior to construction for review, and Chevron shall submit a copy to the City simultaneously. To the extent that any post-construction PHA revalidations are warranted, Chevron shall submit LOPA reports for the post-construction PHA revalidations to the County for review prior to the startup of Project operations, and Chevron shall submit a copy to the City simultaneously.	See response to IV.C of the Reliability Program Annual Report.
4	13	7b	Chevron shall complete an ISSA (as defined in the RISO), including review damage mechanisms and evaluation of their consequences, and LOPAs with written LOPA reports submitted by Chevron to the County for review, for new and modified Modernization Project components as part of the PHA revalidation process specified in the Modernization Project Reliability Program and Mitigation Measure 4.13-7a. Chevron will make the ISSA and PHAs available for review by the CCHS and the City, and will submit the LOPA reports to the County prior to construction for review.	See response to IV.C of the Reliability Program Annual Report.
4	13	7c	Chevron will continue to review its procedures and programs for evaluating the hazards of planned changes at the Facility, and update them to incorporate damage mechanism review, including the identification of applicable damage mechanisms as well as the evaluation of the potential impacts of the damage mechanisms in light of the proposed changes, and layers of protection analysis consistent with the Reliability Program. Chevron s review and update of programs and procedures shall include, at a minimum, the Facility s management of change program/procedure and its PHA program/procedure. Chevron shall include, in its annual Modernization Project Reliability Program reports to the City, a description of the status of this documentation review and update process, as well as how the changes to these programs/procedures are being implemented at the Facility.	Chevron currently has the following controls and processes that incorporate hazard evaluation of planned changes. • Manufacturing 520 (or MFG 520), Damage Mechanism Review Instruction, sets forth work processes to identify applicable damage mechanisms per equipment and piping class metallurgy. This standard incorporates industry practices and recommendations including API Recommended Practice 571, Damage Mechanisms Affecting Fixed Equipment in the Refinery Industry and API Recommended Practice 584, Integrity Operating Windows. • Refinery Instruction, RI-370, Management of Change (MOC) covers the processes used to evaluate planned changes and the revision incorporates damage mechanism reviews consistent with CalARP and CalOSHA requirements. Chevron has developed and implemented its Initial Risk Assessment (IRA) process which requires damage mechanism reviews for major changes. The IRA identifies if the MOC is a major change, the risks associated with the change and whether further study is needed (PHA), any mitigating measures that must be initiated, the necessary training/communication, and updates to affected Process Safety Information (PSI). Based upon the outcome of the assessment, additional evaluations and action items are assigned, and entered in to KMS to be tracked to completion. Prior to implementing a major change, the following actions are taken and documented in the MOC: 1. Perform an Inherently Safer Systems Analysis (ISSA) or Hierarchy of Hazard Control Analysis (HCA) per RI -398, Inherently Safer Systems 2. Review or conduct a Damage Mechanism Review (DMR) per MFG-520 3. PHA Facilitator review for possible What-if, HAZOP, etc. Refinery Instruction, RI-363, Process Hazard Analysis, reissued in December 2018, establishes the organized and systematic processes to evaluate potential hazards in the refinery. The revision to this RI will incorporate Chevron s current practices which include damage mechanism reviews for applicable process units as well as following new regulations and industry best practices.
4	13	7h	Chevron will fund the costs of a third-party expert to assist the County and the City with the review of the Reliability Program reports and other submittals required by the Reliability Program and related mitigation measures, as needed. The third-party expert will be selected and retained by the County or the City within the County s or City s discretion. This funding obligation survives any amendment of the RISO that may require funding of an inspector for the Facility.	Chevron continues to work with Contra Costa Health Services pursuant to the terms of the RISO, and will contribute funds when requested per this requirement.

Reliability Program Recommendations

Attachment RP-2. Reliability Program-Related CUP and MMRP Commitments

Section	Sub	Item	Description	Program Report 2022
4	13	7i	Chevron shall adhere to the total acid number (TAN) limits of 0.3 mg milligrams potassium hydroxide per gram (KOH/g) for crude, 1.5 mg KOH/g for sidecuts produced from the crude unit, and 1.0 for gas oils and blends processed through the fluid catalytic cracker, fluid catalytic cracker feed hydrotreater, hydrocracker, heavy neutral hydrocracker, and light neutral hydrocracker. If Chevron intends to process a feedstock for a short-term basis (i.e., up to 6 months) that exceeds these TAN limits, it must complete its Management of Change (MOC) process, which shall include a corrosion review, for the proposed deviation, and shall take into account any existing damage mechanism reviews as specified in Mitigation Measure 4.13-7c that have been prepared for the identified units and piping circuits. If Chevron intends to process a feedstock for a longer-term basis (i.e., more than 6 months) that exceeds these TAN limits, it must complete its MOC process for the proposed deviation, and the MOC shall include a reliability analysis to evaluate, among other things, existing process conditions, monitoring and inspection data, expected corrosion rates, metallurgy, existing damage mechanism reviews, and monitoring and inspection frequency. The MOC evaluation, for short or longer duration TAN deviations, shall include an evaluation of the potential hazards that could result from the TAN deviation in all affected units and piping circuits, including naphthenic acid corrosion impacts. Chevron shall designate a Facility Area Business Unit Manager with final decision-making authority to approve any TAN deviation from the TAN limits. Chevron shall provide the results of any TAN deviation MOC evaluation to the City and County before processing the feedstock that deviates from the established TAN limits. Chevron shall include in its annual Reliability Program reports: (a) details regarding the results of its MOC for any TAN deviations; (b) average annual TAN for crudes and gas oils/blends processed at the Facility for each calendar year starting with 2008; and (c) for any feedstock runs with TAN levels higher than established TAN limits, include the actual TAN levels of the deviating feeds and the duration of the deviating feedstock runs.	Chevron currently has the following controls and processes in place to meet its ongoing obligation for TAN. • The Crude Acceptance Tool is utilized to determine resulting crude blends and product quality for evaluating any new crude for potential purchase. The tool includes flags for crude blends and resulting sidecuts and FCC/hydrocracker feeds at TAN limits specified by this condition. • Refinery Instruction 370, Management of Change is required for all new crude evaluations. If flags are triggered as a result of the Crude Acceptance Tool, reviews are assigned within the MOC in the KMS software. These MOCs will include approval by the appropriate Area Business Unit Manager or their delegate. • Crude Monitoring Program outlines the roles and responsibilities for TAN monitoring and reporting. If the MOC is approved, the following actions items are assigned: o An MOC action item specifies that the Materials Engineer complete “Mercaptan TAN MOC Addendum”. The Materials Engineer completes a corrosion review or reliability review, as appropriate, based on the planned crude processing duration. The review is recorded in a report titled “MOC for Crude Review [Required for RMP Compliance Plan]”. Records will be permanently attached to the MOC in the KMS software. o The Compliance Specialist (or PSM Specialist) submits a TAN deviation MOC evaluation including corrosion review or reliability analysis, as appropriate, to the City prior to processing the crude or feedstock. o The Project and Permit Team Lead submits the Annual Reliability Program report which includes TAN reporting obligations. Since start of Project operations, there have been no TAN deviations. See Exhibit B for 2022 average annual TAN for crudes and gas oils/blends processed at the facility. Previous year's data was submitted with the 2019, 2020, 2021, and 2022 Reliability Program Reports as Attachment 2 Exhibit B.
4	13	7j	Chevron shall include in its annual Reliability Program reports the annual average sulfur content of feedstocks, including separate annual averages for crude oils/blends and gas oils/blends, processed at the Facility for each year since and including 2008.	See Attachment 2 Exhibit C for 2022 annual average sulfur content of crude oils/blends and gas oils/blends processed as the Facility. Data from 2008 to 2010 was previously provided as part of the Environmental Impact Review for the "Baseline Period". 2011 - 2021 data was submitted with the 2019, 2020, 2021 and 2022 Reliability Program Reports.
			CUP	
B	10		Operation of the new hydrogen plant is subject to all mitigation measures, including those specified in the Reliability Program, set forth in the EIR and final Mitigation Monitoring and Reporting Program. For any future hydrogen export project supplied by hydrogen from the Hydrogen Plant Replacement, associated greenhouse gas emissions must be mitigated to a "No Net Increase" level relative to Baseline using the mitigation measures specified in Mitigation Measures 4.8-2 and 4.8-2B.	Chevron acknowledges this condition. The hydrogen export project referenced in this condition was proposed by Praxair, the previous owner and developer of the proposed new Hydrogen Plant. Chevron is now the owner of the Hydrogen Plant and has not proposed a hydrogen export project.
G	1		Chevron shall implement the Modernization Project Reliability Program (set forth as Appendix 4.13-PROG of the EIR) in its entirety as a condition of this Conditional Use Permit.	Chevron has implemented the Modernization Project Reliability Program (set forth as Appendix 4.13-PROG of the EIR) in its entirety, including processes to implement and track ongoing obligations. Contra Costa Health Services has reviewed compliance materials related to Chevron s implementation of the Reliability Program in 2018, 2019, 2020, and 2022 and Chevron continues to work with CCHS in this regard.
G	5		Within six months prior to commencing Project operations, Chevron shall review the corrosion data and flag dates of fixed equipment and piping in process units susceptible to high-temperature sulfidation identified in the Reliability Analysis (taking into account the most current actual conditions combined with post-Project projected corrosion rates predicted based on McConomy curves) and ensure that enhanced monitoring and inspection measures, including those identified in the Reliability Analysis and Reliability Program, are implemented after commencement of Project operations to periodically verify actual post-Project corrosion rates and adjust any flag dates or replacement plans as warranted. Pursuant to the Richmond Industrial Safety Ordinance, Chevron shall make all information relating to its verification, monitoring, and inspection activities available to the City and County and their respective third-party experts upon request, with review by a committee constituted of the dedicated full-time process safety inspector required by the Richmond Industrial Safety Ordinance and Mitigation Measure 4.13-7d, the Contra Costa County Health Services Chief Environmental Health and Hazardous Materials Officer, and a qualified third-party expert selected by the City.	In July 2018, Chevron utilized the most current actual conditions in conjunction with predicted post-project corrosion rates and completed a corrosion data and flag date review for each of the affected process units. Additionally, Chevron has implemented enhanced monitoring and inspection measures in each of the affected process units. CCHS verified completion of this measure as part of its pre-startup review.

OW - Level 2 Ale t Events - Attachment RP-2, Exh b t A

IOW Descript on/Tag	Date	Duration (days)	Responsa / Resolution
H gh-11TB602.CALC.DAVG - IOW2 - DRE 4CU F1160 RADIANT HIGH SKIN TEMP - COR	1/5/2022	2.00	Process returned to normal operations in less than 7 days-no action required
H eh-11TB602.CALC.DAVG - IOW2 - DRE 4CU F1160 RADIANT HIGH SKIN TEMP - COR	1/22/2022	4.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TB211.CALC.DAVG - IOW2 - DRE 4CU F1100B HIGH SKIN TEMP - COR	1/24/2022	22.00	Managed plant rates.
H gh-11TB602.CALC.DAVG - IOW2 - DRE 4CU F1160 RADIANT HIGH SKIN TEMP - COR	1/27/2022	19.00	Managed plant rates. Inspections and maintenance was completed during D&R 2022 maintenance event.
H gh-11TB602.CALC.DAVG - IOW2 - DRE 4CU F1160 RADIANT HIGH SKIN TEMP - COR	02/19/22	27.00	Managed plant rates. Inspections and maintenance was completed during D&R 2022 maintenance event.
H gh-11TI984.DAVG - IOW2 - DRE 4CU E1111 TUBE S DE COMB OUT - COR	03/14/22	3.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TI984.DAVG - IOW2 - DRE 4CU E1111 TUBE S DE COMB OUT - COR	03/26/22	84.00	Inspections and maintenance was completed during D&R 2022 maintenance event.
H gh-85TI749.DAVG - IOW2 - HYD RLOP HNC E1503 TO E155S - COR	05/03/22	1.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TB602.CALC.DAVG - IOW2 - DRE 4CU F1160 RADIANT HIGH SKIN TEMP - COR	5/14/2022	1.00	Process returned to normal operations in less than 7 days-no action required
H gh-76TI7204.DAVG - OW2 - NI ISO7 C720 BTMS - COR	05/24/22	3.00	Process returned to normal operations in less than 7 days-no action required
H gh-76TI7232.DAVG - OW2 - NI ISO7 E737 S/S OUT TO C732 - COR	05/24/22	3.00	Process returned to normal operations in less than 7 days-no action required
H gh-76TI7204.DAVG - OW2 - NI ISO7 C720 BTMS - COR	07/03/22	2.00	Process returned to normal operations in less than 7 days-no action required
H gh-76TI7232.DAVG - OW2 - NI ISO7 E737 S/S OUT TO C732 - COR	07/04/22	1.00	Process returned to normal operations in less than 7 days-no action required
H gh-76TI7233.DAVG - OW2 - NI ISO7 C732 BOTTOMS TO P736/A - COR	07/04/22	1.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TI303.DAVG - IOW2 - DRE 4CU RESID FROM E1163B - COR	08/18/22	7.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TI413.DAVG - IOW2 - DRE 4CU RESID FROM E1163A - COR	08/18/22	16.00	Process moves were made to manage the low plant rates upon startup from the 3Q 2022 D&R maintenance event. Once normal rates were reached the IOW was resolved.
H gh-11TI412.DAVG - IOW2 - DRE 4CU ABCR TO C1100 - COR	08/20/22	6.00	Process moves were made to manage the low plant rates upon startup from the 3Q 2022 D&R maintenance event. Once normal rates were reached the IOW was resolved.
H gh-11TI303.DAVG - IOW2 - DRE 4CU RESID FROM E1163B - COR	09/04/22	24.00	Process moves were made to manage the low plant rates upon startup from the 3Q 2022 D&R maintenance event. Once normal rates were reached the IOW was resolved.
H gh-11TI413.DAVG - IOW2 - DRE 4CU RESID FROM E1163A - COR	09/04/22	24.00	Process moves were made to manage the low plant rates upon startup from the 3Q 2022 D&R maintenance event. Once normal rates were reached the IOW was resolved.
H gh-11TI536.DAVG - IOW2 - DRE 4CU BYPASS AROUND E1112 - COR	10/31/22	9.00	Process moves were made to manage the high temperatures around the exchanger.
H eh-11TI413.DAVG - IOW2 - DRE 4CU RESID FROM E1163A - COR	11/01/22	10.00	Process moves were made to manage the high temperatures in the exchanger.
H gh-11TI303.DAVG - IOW2 - DRE 4CU RESID FROM E1163B - COR	11/02/22	6.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TI536.DAVG - IOW2 - DRE 4CU BYPASS AROUND E1112 - COR	11/10/22	2.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TI303.DAVG - IOW2 - DRE 4CU RESID FROM E1163B - COR	11/12/22	5.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TI413.DAVG - IOW2 - DRE 4CU RESID FROM E1163A - COR	11/12/22	6.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TI536.DAVG - IOW2 - DRE 4CU BYPASS AROUND E1112 - COR	11/14/22	1.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TI536.DAVG - IOW2 - DRE 4CU BYPASS AROUND E1112 - COR	11/20/22	2.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TI413.DAVG - IOW2 - DRE 4CU RESID FROM E1163A - COR	11/21/22	3.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TI412.DAVG - IOW2 - DRE 4CU ABCR TO C1100 - COR	11/23/22	12.00	Process moves were made to manage the high plant rates upon startup from the 3Q 2022 D&R maintenance event. Once normal rates were reached the IOW was resolved.
H gh-11TI412.DAVG - IOW2 - DRE 4CU ABCR TO C1100 - COR	12/20/22	2.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TI412.DAVG - IOW2 - DRE 4CU ABCR TO C1100 - COR	12/26/22	1.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TI303.DAVG - IOW2 - DRE 4CU RESID FROM E1163B - COR	12/27/22	1.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TI412.DAVG - IOW2 - DRE 4CU ABCR TO C1100 - COR	12/28/22	3.00	Process returned to normal operations in less than 7 days-no action required
H gh-11TI413.DAVG - IOW2 - DRE 4CU RESID FROM E1163A - COR	12/28/22	2.00	Process returned to normal operations in less than 7 days-no action required

Annual Average TAN - Attachment RP-2 Exhibit B

MMRP 4.13-7i Annual Average TAN	
	2022
Crude	0.143
Gas oils/blends	0.132

Annual Average Sulfur Content - Attachment RP-2, Exhibit C

MMRP 4.13-7j Annual Average Sulfur Content	
	2022
Crude oils/blends	2.07
Gas oils/blends	1.39

ATTACHMENT 3
Reliability Program Implementation of General Recommendations

CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
Modernization Project Reliability Program
Implementation of General Recommendations

2022

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

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INTRODUCTION

On July 29, 2014, the City of Richmond certified the Final Environmental Impact Report (EIR) for and approved Conditional Use Permit and Design Review Permit No. PLN11-089 (CUP) authorizing construction and operation of the Modernization Project. The EIR and CUP required implementation of the Modernization Project Reliability Program included as Appendix 4.13-PROG, which contains both general and project-specific recommendations identified in Appendix 4.13-REL – Reliability Analysis of Modernization Project Changes. The General Recommendations set forth in Section II of the Reliability Program reflected "several general observations and recommendations of broader applicability" related to the Refinery's work process for managing identifying and addressing the potential impact of damage mechanisms on mechanical integrity.

As stated in Section I of the Reliability Program, at the time the EIR was certified and the Reliability Program adopted, the Refinery was already in the process of implementing various actions "to enhance its mechanical-integrity program and overall Refinery safety, which Chevron believes address the general recommendations." Since that time, the Refinery has reported its progress on the implementation of these actions in quarterly reports required by section 4.13-13d of the mitigation monitoring and reporting program (MMRP). The U.S. Chemical Safety Board responded and closed the final recommendation, pursuant to the CSB investigation of the 2012 Chevron Richmond Refinery Fire. All corrective actions taken to implement agency recommendations and as a result of Chevron's internal investigation have been implemented and, where required, integrated into Chevron's maintenance and operating procedures. The corrective actions are therefore closed. As such, there will be no further updates pursuant to Mitigation Measure 4.13-13d. The Refinery submitted its twenty-fourth and final Quarterly Crude Fire Corrective Action Status Report (MM 4.13-13d) under the quarterly reporting requirement on March 31, 2021. This report further summarizes the status of those actions in the context of the General Recommendations 1, 2, 3 and 5. Chevron has separately reported on its implementation of General Recommendation 4 concerning its Positive Material Identification (PMI) Procedure. A copy of that report was included with the 2018 Reliability Program Report submittal.

REPORT

II. General Recommendations and Refinery Actions to Address

General Recommendation 1: Chevron should ensure that its organizational communication procedures and work processes incorporate mechanisms by which risk concerns, corrective actions, and recommendations that are identified (e.g., during inspections, turnarounds, audits, PHAs, etc.) by personnel (or contractors) are addressed, reviewed and authorized by management as appropriate, tracked, and closed out, and that the rationale for any decision not to implement a recommendation or corrective action, or otherwise address a risk concern, are clearly documented.

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Response: The Refinery has taken numerous steps to enhance its organizational communication procedures and work processes to address risk concerns and track implementation of corrective actions and recommendations.

In 2017, the Refinery implemented a manufacturing instruction for addressing mechanical integrity-related inspection recommendations, including development of mitigation plans, timelines for completion, and the assignment of roles and responsibilities. MFG 530, Fixed Equipment Integrity Threat Recommendation and Resolution Instruction, establishes a process for identifying integrity threats and issuing recommendations, and developing associated resolution plans designed to prevent and mitigate loss of containment due to fixed equipment degradation. Under MFG 530, a fully developed integrity threat recommendation, among other things:

- Is a high-quality, data-driven recommendation for deficiencies discovered on in-scope fixed equipment.
- Includes a resolution plan with agreed-upon completion dates.
- Includes a mitigation plan if mitigation is required to enable continued Operation until final resolution can be achieved.
- Defines clear handoffs to work prioritization, planning, and execution processes.
- Verifies and documents completion of resolution and mitigation plans.
- Provides input to maintain evergreen asset strategies for fixed equipment.

MFG 530 is applicable to most types of fixed equipment used in the refinery process, including pressure vessels, boilers, on-plot and off-plot piping, atmospheric storage tanks, and furnaces. The objective is to guide the development of integrity threat recommendations to prevent loss of containment events of higher consequence. The instruction and supporting procedures provide detail to support the mechanical integrity program.

Pursuant to the process established in MFG 530, for integrity threats to fixed equipment, all resolutions and/or mitigation plans, if mitigation is required, and target completion dates, must be approved by both the Operations Management for the affected unit and Fixed Equipment Integrity Lead/Manager ("FEIM"). If Operations Management and the FEIM do not on agree on the resolution/mitigation plan or the target completion dates, the FEIM shall escalate the decision to the Refinery General Manager. All open integrity threats are tracked in OERI in an effort to ensure the resolution/mitigation plan are implemented prior to the target completion date. Any employee may raise any concern about the resolution/mitigation plan or the target completion date with their supervisor or their supervisor's manager, or may use their personal stop work authority.

Further, on September 20, 2014, the State of California enacted Senate Bill 1300 that imposes on California refineries certain notification obligations regarding turnaround work. 2014 Cal. Stat. ch. 519 (S.B. 1300) (codified at Cal. Lab. Code § 7872). Among other provisions, S.B. 1300 requires a petroleum refinery employer to make available upon request to Cal/OSHA "[n]otification and description of all repairs, design modifications, or process changes described

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in a corrosion report, risk-based inspection report, process hazard analysis, boiler permit schedule, management of change record, work order, or other document listed in paragraphs (1) to (6), inclusive, that the petroleum refinery employer has deferred to a subsequent operational period or turnaround." Cal. Lab. Code § 7872(c)(7) (emphasis added).

The Richmond Refinery's turnaround tracking process is consistent with S.B. 1300 and establishes the process by which the Refinery maintains the information required by California law. Among the information that the Refinery maintains is a Turnaround Database of potential turnaround work items that include the ultimate determination of deferral or rejection of the item. The Turnaround Database allows personnel to search the status of any turnaround work item, generate a report that demonstrates the approval status of turnaround work items, and review any denied or deferred work items. Additionally, the Turnaround Database identifies the name of the supervisor and the name of employee(s) who provided comments or made a determination regarding approval status. When action is taken on a Living Worklist ("LWL") item, the originator receives an email notification regarding the change in status. The notification includes the LWL item number, the status change, and a link to the Turnaround Database entry for viewing Decision Notes and Decision Attendees. Chevron encourages employees to raise any concerns about a denial or deferral with their supervisor or their supervisor's manager.

In addition, Chevron has implemented improvements to the Turnaround Database and improvements to guidance materials that further emphasize the ability of the originator to seek additional review of deferred or denied turnaround work items. The updated Turnaround Database Approval Process Flow Chart, which serves as an implementation guidance document for the Turnaround Database, and the revised turnaround work item status change email notification further reiterate and reinforce Chevron's policy that the originator of a work item has the option to seek further review of denied or deferred recommendations with higher level management.

General Recommendation 2: Chevron should further clarify and incorporate into their mechanical integrity program and program documents periodic reviews of work processes, procedures, inspection strategies, etc. to account for physical, operational and organizational changes over time that could affect the assumptions that went into the original decisions. Examples that illustrate this include: (1) periodic reviews of inspection CML densities and placements to ensure that unpredictable damage mechanisms can be detected and (2) reviews of wet H2S damage risk, based on crude feed constituent changes. Chevron reports that it is developing "asset strategy plans" for each process unit, and that the development of the asset strategy plans will address this recommendation by including review of inspection procedures, working documents, CMLs, and damage mechanisms, and that the asset strategy plans will identify and implement changes needed to each as a result of the review. Whether called an "asset strategy plan" or otherwise included in another safety program (e.g., included as part of the Richmond Industrial Safety Ordinance documentation), Chevron should clarify its implementation tracking process for changes needed as a result of these periodic reviews.

Response: The Richmond Refinery modified and further developed its work processes for the review of damage mechanisms. Specifically, CUSA issued a refinery standard ("Damage

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Mechanism Review Instruction – Manufacturing 520," or "MFG 520") for conducting a damage mechanism review ("DMR") to assess corrosion threats and other applicable damage mechanisms. MFG 520 sets forth a DMR work process that was designed in accordance with industry practices and recommendations, and American Petroleum Institute ("API") Recommended Practice 571, *Damage Mechanisms Affecting Fixed Equipment in the Refining Industry*. CUSA also considered API Recommended Practice 584, *Integrity Operating Windows*, while this recommended practice was in development. MFG 520 requires:

- Completion of a DMR work process for piping circuits and equipment in applicable units so as to formalize the evaluation of known damage mechanisms, the consequences of a failure, and the safeguards necessary to mitigate failures and other potential risks from those damage mechanisms;
- Development of CUSA standard templates for refinery-common units;
- Creation of a DMR schedule aligned with Process Hazard Analysis ("PHA") schedules for all piping circuits and equipment in applicable units so that damage mechanisms can be considered during PHAs;
- Establishment of multi-disciplinary DMR teams;
- Evaluation of piping circuits and equipment in applicable units against potential damage mechanisms in connection with assessment triggers;
- Consideration of consequences of failures and safeguards identified by the DMR work process;
- Consideration of CUSA and applicable industry best practices;
- Creation of DMR reports, which includes recommendations as appropriate;
- Development of action plans to address DMR recommendations; and
- Provision of DMR work product to the applicable PHA team for consideration.

Inherently safer systems have been incorporated into the DMR template design and evaluated, as appropriate. For example, there are damage mechanism assessment questions that help determine whether or not a change or upgrade in metallurgy would be recommended to prevent or better manage a particular damage mechanism.

Additionally, consistent with and building upon MFG 520, CUSA has developed an asset strategy standard ("Fixed Equipment Asset Strategies Standard--Manufacturing Standard 525," or "MFG 525"). This standard sets expectations for asset strategies designed to prevent and mitigate losses of containment in fixed equipment and describes the process for creating and maintaining these strategies.

Specifically, the Refinery modified its PHA procedures to better integrate DMRs into the PHA review process. MFG 520 requires alignment of the DMR schedule with the PHA schedules for piping circuits and equipment in applicable units so that damage mechanisms can be considered during PHAs. The Refinery took a lead role in piloting DMRs as this work process was developed. On January 1, 2014, the Refinery instituted a requirement that all PHA teams consider applicable DMRs when conducting PHAs for covered plants.

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MFG 520 recognizes that the DMR work process will undergo continuous improvement as internal and external guidance is developed. Concurrent with development of the DMR work process and in response to a corrective action from its own investigation, CUSA has developed an asset strategy standard, MFG 525, which is used where applicable. As described above in CUSA's response to CSB Recommendation 2012-03-I-CA-R1, MFG 525 sets the expectations for asset strategies designed to prevent and mitigate losses of containment in fixed equipment and to describe the process for creating and maintaining these strategies. MFG 525 defines an asset strategy as the documented plan for operating, monitoring, and maintaining fixed equipment so as to preserve its pressure boundary. As part of a living program for continual improvement, an asset strategy identifies damage mechanisms; determines the need for and defines operating limits known as integrity operating windows; and prescribes inspection plans, including tasks and frequencies required to manage identified damage mechanisms.

The Refinery also developed the Fixed Equipment Integrity Manager position, with responsibility for developing, implementing, and stewarding the fixed equipment program.

General Recommendation 3: Chevron should leverage its existing infrastructure and technology to lessen the reliance on human interaction in responding to potential risks, including for example Chevron's current pilot project to implement Integrity Operating Windows per the guidelines of the draft API 584 Recommended Practice for the crude unit. Chevron should extend the pilot project to the remaining operating units.

Response: The Refinery has implemented a process to create and utilize asset strategy plans for each process unit at the piping circuit level, which is integrated into the DMR process and includes, among other things, integrity operating windows consistent with draft *API 584 – Integrity Operating Windows* and consideration of process conditions, inspections techniques and frequency, mixing and injection points, and corrosion monitoring locations (CML). These asset strategy plans will be implemented for all processing units on an ongoing basis. Further, the Refinery has significantly expanded and implemented its Integrity Operating Window (IOW) per API RP 584.

General Recommendation 5: Chevron should review and modify their Piping Inspection Procedure to incorporate an engineering review of thickness inspection data with near term "Flag" dates for high risk equipment/piping to assure that the actual minimum thickness associated with the Flag date has either been verified through inspection or, alternatively, the inspection data analyzed with techniques such as a statistical analysis (95% CL or extreme value analysis) to evaluate what risk is involved if the actual minimum thickness was not measured.

Response: Manufacturing Instruction for Minimum Required Pipe Wall Thickness ("MFG 510") was revised in March 2018. This instruction "outlines the work process and calculation methods for determining minimum required pipe wall thickness of ferritic and austenitic steel piping systems within limits set by accepted piping codes and standards." If thickness is at, or is projected to be, below minimum required thickness, then MFG 510 requires an approved integrity threat mitigation plan to document the technical basis for continued operation to a lower value. MFG 510 also addresses the training, qualification, and documentation requirements for

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personnel involved in establishing minimum required pipe wall thickness. The Richmond Refinery maintains a record of engineers qualified to execute these calculations.

ETC facilitates an instructor-led course entitled “Fitness for Service – Level 1 Practitioner Training.” The course format is a two-day instruction/workshop followed by an additional day of testing and certification. The course is based on API 579-1/ASME FFS-1 and is structured as a workshop, using example problems to demonstrate FFS procedures using Chevron’s ETC Level 1 software. The training is designed for design engineers. Certifications are issued to those who complete the training course and pass the test. Only certified personnel are authorized to perform a second level review and approve FFS Level 1 assessments, and only ETC is authorized to perform FFS Level 2 and 3 assessments. Richmond Refinery keeps a log of the active personnel certified to perform a second level review and approve FFS Level 1 assessments.

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ATTACHMENT 4
Reliability Program Report IV.B

CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
RELIABILITY PROGRAM § IV.B REPORT

2022

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

Chevron U.S.A. Inc. ("CUSA" or "the Company") submits this report to comply with section IV.B of Appendix 4.13-PROG – Modernization Project Reliability Program, which provides:

> All piping circuits in the Refinery, including the new 9 Chrome circuits being installed pursuant to § III.A of this Reliability Program, are regularly monitored and inspected. Beginning one year from commencement of Project operations, and annually thereafter, the Refinery will provide reports to the City summarizing the monitoring and inspection results for the identified circuits. These reports shall at a minimum include the following information:
>
> - A list of all piping circuits identified as potentially susceptible to sulfidation corrosion, including specifically piping circuits identified during the reliability review for the Modernization Project as being susceptible to sulfidation corrosion and subject to potential process changes.
> - A list of components identified through the 100% component inspection conducted following the August 6, 2012 incident pursuant to the methodologies set forth in the API 939-C - Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries and Updated Inspection Strategies for Preventing Sulfidation Corrosion Failures in Chevron Refineries (Sept. 30, 2009) that may lack sufficient thickness to remain in service until the next scheduled turnaround.
> - A description of the solutions implemented with respect to components of insufficient thickness identified above.
> - A description of the current fixed inspection frequency for carbon steel piping circuits identified as potentially susceptible to sulfidation corrosion.
> - A description of any findings from inspection and monitoring of the piping circuits identified during the reliability review for the Modernization Project as being susceptible to sulfidation corrosion and subject to potential process changes that indicate that any of these circuits lack sufficient thickness to remain in service until the next turnaround and a description of the solution to be implemented with respect to these circuits.
> - Chevron shall obtain all required permits for replacement of these piping circuits pursuant to the California Building Standards Code, inclusive of the California Fire Code, and, once the piping circuits are replaced, shall submit copies of closed permits to the Planning Department to demonstrate compliance with this commitment.

A list of all piping circuits identified as potentially susceptible to sulfidation corrosion, including those identified during the reliability review for the Modernization Project, can be found in Appendix A, along with the current fixed inspection frequency.

The list of components identified through the 100% component inspection conducted following the August 6, 2012 incident was previously provided to U.S. EPA. Solutions implemented with respect to components of insufficient thickness identified above were also previously shared with U.S. EPA through the Annual Report pursuant to Paragraph XV of the Consent Decree. A copy of this Annual Report is maintained at the Richmond Refinery and can be made available upon request.

Findings from inspection and monitoring of the piping circuits identified during the reliability review for the Modernization Project were previously provided to Cal OSHA as part of the

Terms and Conditions of Probation. A copy of the most recent report is maintained at the Richmond Refinery and can be made available upon request.

Chevron previously reported on the replacement of 17 piping circuits and four partial piping and valve replacements identified in III.A of the Reliability Program. The City authorized the replacement work through the "Annual Provisional Construction Permit" (No. F14-06939), issued by the City of Richmond Fire Department. A final update on the status of these replacements was submitted in August 2018 and included in the 2018 Reliability Program Report as Attachment 4. CCHS reviewed documents demonstrating compliance in August 2018. Since the commencement of operations (April 17, 2019), no additional piping circuits have been replaced. A copy of the most recent inspection results is maintained at the Richmond Refinery and can be reviewed at the Refinery upon request.

Appendix A

Piping Circuits Susceptible to Sulfidation Corrosion

Unit	Functional Location	Damage Mechanism	Desired Interval	API Pipe Class
FCC Unit	0101-X001-100	Sulfidation (IS01)	10	2
FCC Unit	0101-X002-010	Sulfidation (IS01)	2.5	2
FCC Unit	0101-X003-010	Sulfidation (IS01)	10	2
FCC Unit	0101-X005-020	Sulfidation (IS01)	3, 10	2
FCC Unit	0101-X005-J01	Sulfidation (IS01)	3	1
FCC Unit	0101-X005-J02	Sulfidation (IS01)	3, 5	1
FCC Unit	0101-X006-010	Sulfidation (IS01)	10	2
FCC Unit	0101-X006-J01	Sulfidation (IS01)	3	2
FCC Unit	0101-X007-010	Sulfidation (IS01)	2.5, 5	1
FCC Unit	0101-X017-010	Sulfidation (IS01)	2.5, 5	1
FCC Unit	0101-X017-020	Sulfidation (IS01)	10	2
FCC Unit	0101-X017-030	Sulfidation (IS01)	5	1
FCC Unit	0101-X017-040	Sulfidation (IS01)	5	1
FCC Unit	0101-X017-050	Sulfidation (IS01)	5	1
FCC Unit	0101-X017-060	Sulfidation (IS01)	5	1
FCC Unit	0101-X018-010	Sulfidation (IS01)	10	2
FCC Unit	0101-X018-020	Sulfidation (IS01)	5	1
FCC Unit	0101-X018-030	Sulfidation (IS01)	5	1
FCC Unit	0101-X018-040	Sulfidation (IS01)	2.5, 5	1
FCC Unit	0101-X018-050	Sulfidation (IS01)	2.5, 5	1
FCC Unit	0101-X018-090	Sulfidation (IS01)	5	1
FCC Unit	0101-X018-100	Sulfidation (IS01)	5	1
FCC Unit	0101-X018-130	Sulfidation (IS01)	10	2
FCC Unit	0101-X044-010	Sulfidation (IS01)	10	2
PROPLYENE POLYMER	0110-X030-010	Sulfidation (IS01)	5	1
PROPLYENE POLYMER	0110-X030-020	Sulfidation (IS01)	5	1
PROPLYENE POLYMER	0110-X030-030	Sulfidation (IS01)	5	1
PROPLYENE POLYMER	0110-X030-040	Sulfidation (IS01)	5	1
PROPLYENE POLYMER	0110-X030-050	Sulfidation (IS01)	5	1
PROPLYENE POLYMER	0110-X033-010	Sulfidation (IS01)	5	1
PROPLYENE POLYMER	0110-X033-020	Sulfidation (IS01)	5	1
PROPLYENE POLYMER	0110-X033-030	Sulfidation (IS01)	5	1
PROPLYENE POLYMER	0110-X033-040	Sulfidation (IS01)	5	1
PROPLYENE POLYMER	0110-X037-020	Sulfidation (IS01)	10	2
NO 1 SRU - PLANT 2100	0125-X004-010	Sulfidation (IS01)	3	1
NO 1 SRU - PLANT 2100	0125-X006-030	Sulfidation (IS01)	10	2
NO 1 SRU - PLANT 2100	0125-X007-010	Sulfidation (IS01)	10	2
NO 2 SRU - PLANT 2200	0126-X004-010	Sulfidation (IS01)	3	1
NO 2 SRU - PLANT 2200	0126-X004-030	Sulfidation (IS01)	3	1

NO 2 SRU - PLANT 2200	0126-X004-060	Sulfidation (IS01)	3	1
NO 2 SRU - PLANT 2200	0126-X006-030	Sulfidation (IS01)	10	2
NO 2 SRU - PLANT 2200	0126-X007-010	Sulfidation (IS01)	10	2
NO 3 SRU - PLANT 2300	0127-X004-010	Sulfidation (IS01)	3	1
NO 3 SRU - PLANT 2300	0127-X004-030	Sulfidation (IS01)	3	1
NO 3 SRU - PLANT 2300	0127-X006-030	Sulfidation (IS01)	10	2
SDA	0401-X003-050	Sulfidation (IS01)	5	1
SDA	0401-X004-010	Sulfidation (IS01)	5	1
SDA	0401-X004-020	Sulfidation (IS01)	5	1
SDA	0401-X004-060	Sulfidation (IS01)	5	1
SDA	0401-X005-010	Sulfidation (IS01)	5	1
SDA	0401-X005-J01	Sulfidation (IS01)	3	1
SDA	0401-X006-010	Sulfidation (IS01)	5	1
SDA	0401-X006-020	Sulfidation (IS01)	5	1
SDA	0401-X006-030	Sulfidation (IS01)	5	1
SDA	0401-X006-040	Sulfidation (IS01)	5	1
SDA	0401-X007-010	Sulfidation (IS01)	5	1
SDA	0401-X008-040	Sulfidation (IS01)	5	1
SDA	0401-X008-J01	Sulfidation (IS01)	3	1
SDA	0401-X008-J02	Sulfidation (IS01)	3	1
SDA	0401-X009-010	Sulfidation (IS01)	10	2
SDA	0401-X009-020	Sulfidation (IS01)	10	2
SDA	0401-X010-010	Sulfidation (IS01)	10	2
SDA	0401-X010-020	Sulfidation (IS01)	10	2
SDA	0401-X010-030	Sulfidation (IS01)	5	1
SDA	0401-X013-010	Sulfidation (IS01)	10	2
SDA	0401-X013-020	Sulfidation (IS01)	10	2
SDA	0401-X013-030	Sulfidation (IS01)	10	2
SDA	0401-X015-010	Sulfidation (IS01)	10	2
SDA	0401-X015-020	Sulfidation (IS01)	5	1
SDA	0401-X015-030	Sulfidation (IS01)	5	1
SDA	0401-X015-040	Sulfidation (IS01)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X002-030	High Temp H2/H2S Corrosion (IS04)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X002-040	High Temp H2/H2S Corrosion (IS04)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X002-050	High Temp H2/H2S Corrosion (IS04)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X002-060	High Temp H2/H2S Corrosion (IS04)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X002-J01	High Temp H2/H2S Corrosion (IS04)	3	1

TKC REACT/DISTILL PLT 4/PLT 7	0403-X002-J02	High Temp H2/H2S Corrosion (IS04)	3	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X003-010	High Temp H2/H2S Corrosion (IS04)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X003-020	High Temp H2/H2S Corrosion (IS04)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X004-010	High Temp H2/H2S Corrosion (IS04)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X004-020	High Temp H2/H2S Corrosion (IS04)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X021-030	Sulfidation (IS01)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X030-010	Sulfidation (IS01)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X030-020	Sulfidation (IS01)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X030-030	Sulfidation (IS01)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X032-010	Sulfidation (IS01)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X032-020	Sulfidation (IS01)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X032-030	Sulfidation (IS01)	5	1
TKC REACT/DISTILL PLT 4/PLT 7	0403-X032-040	Sulfidation (IS01)	10	2
TKC REACT/DISTILL PLT 4/PLT 7	0403-X032-050	Sulfidation (IS01)	10	2
TKN REACTION PLT 5	0404-X001-070	Sulfidation (IS01)	2.5, 10	2
TKN REACTION PLT 5	0404-X001-080	Sulfidation (IS01)	10	2
TKN REACTION PLT 5	0404-X002-030	High Temp H2/H2S Corrosion (IS04)	5	1
TKN REACTION PLT 5	0404-X003-010	High Temp H2/H2S Corrosion (IS04)	5	1
TKN REACTION PLT 5	0404-X003-020	High Temp H2/H2S Corrosion (IS04)	5	1
TKN REACTION PLT 5	0404-X003-030	High Temp H2/H2S Corrosion (IS04)	5	1
TKN REACTION PLT 5	0404-X003-040	High Temp H2/H2S Corrosion (IS04)	5	1
TKN REACTION PLT 5	0404-X007-010	High Temp H2/H2S Corrosion (IS04)	10	2
ISOCRKG REACTION PLT 6	0405-X001-010	Sulfidation (IS01)	2.5	2
ISOCRKG REACTION PLT 6	0405-X002-010	High Temp H2/H2S Corrosion (IS04)	3	1
ISOCRKG REACTION PLT 6	0405-X002-010	High Temp H2/H2S Corrosion (IS04)	2.5	1
ISOCRKG REACTION PLT 6	0405-X002-020	High Temp H2/H2S	2.5	1

		Corrosion (IS04)		
ISOCRKG REACTION PLT 6	0405-X002-020	High Temp H2/H2S Corrosion (IS04)	5	1
ISOCRKG REACTION PLT 6	0405-X002-030	High Temp H2/H2S Corrosion (IS04)	2.5	1
ISOCRKG REACTION PLT 6	0405-X003-020	High Temp H2/H2S Corrosion (IS04)	5	1
ISO DIST/GAS RECY PLT 7	0406-X001-020	Sulfidation (IS01)	5	1
ISO DIST/GAS RECY PLT 7	0406-X005-010	Sulfidation (IS01)	2.5	1
ISO DIST/GAS RECY PLT 7	0406-X013-040	Sulfidation (IS01)	5	1
ISO DIST/GAS RECY PLT 7	0406-X013-050	Sulfidation (IS01)	5	1
ISO DIST/GAS RECY PLT 7	0406-X013-060	Sulfidation (IS01)	5	1
ISO DIST/GAS RECY PLT 7	0406-X013-070	Sulfidation (IS01)	5	1
ISO DIST/GAS RECY PLT 7	0406-X013-080	Sulfidation (IS01)	5	1
ISO DIST/GAS RECY PLT 7	0406-X015-010	Sulfidation (IS01)	5	1
ISO DIST/GAS RECY PLT 7	0406-X015-020	Sulfidation (IS01)	2.5, 5	1
ISO DIST/GAS RECY PLT 7	0406-X015-030	Sulfidation (IS01)	5	1
ISO DIST/GAS RECY PLT 7	0406-X015-040	Sulfidation (IS01)	2.5, 5	1
ISO DIST/GAS RECY PLT 7	0406-X015-050	Sulfidation (IS01)	2.5, 5	1
ISO DIST/GAS RECY PLT 7	0406-X015-060	Sulfidation (IS01)	2.5, 5	1
ISO DIST/GAS RECY PLT 7	0406-X015-070	Sulfidation (IS01)	5	1
LT NEUT H/CRKR PLT 11	0414-X001-040	Sulfidation (IS01)	10	2
LT NEUT H/CRKR PLT 11	0414-X001-050	Sulfidation (IS01)	2.5	2
LT NEUT H/CRKR PLT 11	0414-X002-010	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT H/CRKR PLT 11	0414-X002-020	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT H/CRKR PLT 11	0414-X002-030	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT H/CRKR PLT 11	0414-X003-010	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT H/CRKR PLT 11	0414-X003-020	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT H/CRKR PLT 11	0414-X005-040	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT H/CRKR PLT 11	0414-X008-030	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT HC DIST PLT 12	0415-X001-010	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT HC DIST PLT 12	0415-X001-020	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT HC DIST PLT 12	0415-X006-010	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT HC DIST PLT 12	0415-X006-020	High Temp H2/H2S Corrosion (IS04)	5	1

LT NEUT HC DIST PLT 12	0415-X006-050	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT HC DIST PLT 12	0415-X006-060	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT HC DIST PLT 12	0415-X006-070	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT HC DIST PLT 12	0415-X007-010	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT HC DIST PLT 12	0415-X007-020	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT HC DIST PLT 12	0415-X007-030	High Temp H2/H2S Corrosion (IS04)	5	2
LT NEUT HC DIST PLT 12	0415-X007-040	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT HC DIST PLT 12	0415-X008-010	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT HC DIST PLT 12	0415-X008-020	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT HC DIST PLT 12	0415-X008-030	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT HC DIST PLT 12	0415-X008-040	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT HC DIST PLT 12	0415-X008-050	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT HC DIST PLT 12	0415-X013-010	High Temp H2/H2S Corrosion (IS04)	5	2
LT NEUT HC DIST PLT 12	0415-X013-020	High Temp H2/H2S Corrosion (IS04)	5	2
LT NEUT HC DIST PLT 12	0415-X013-030	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT HC DIST PLT 12	0415-X013-050	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT HC DIST PLT 12	0415-X013-060	High Temp H2/H2S Corrosion (IS04)	5	2
LT NEUT HC DIST PLT 12	0415-X013-070	High Temp H2/H2S Corrosion (IS04)	5	2
LT NEUT HC DIST PLT 12	0415-X014-010	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT HC DIST PLT 12	0415-X014-020	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT HC DIST PLT 12	0415-X014-030	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT HC DIST PLT 12	0415-X015-010	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT HC DIST PLT 12	0415-X015-020	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT H/FINISH PLT 13	0416-X002-030	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT H/FINISH PLT 13	0416-X002-J01	High Temp H2/H2S	3	1

		Corrosion (IS04)		
LT NEUT H/FINISH PLT 13	0416-X003-010	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT H/FINISH PLT 13	0416-X003-J01	High Temp H2/H2S Corrosion (IS04)	3	1
LT NEUT H/FINISH PLT 13	0416-X013-030	High Temp H2/H2S Corrosion (IS04)	5	1
LT NEUT H/FINISH PLT 13	0416-X018-010	Sulfidation (IS01)	10	2
LT NEUT H/FINISH PLT 13	0416-X018-020	Sulfidation (IS01)	10	2
LT NEUT H/FINISH PLT 13	0416-X018-030	Sulfidation (IS01)	10	2
LT NEUT H/FINISH PLT 13	0416-X018-040	Sulfidation (IS01)	10	2
HV NEUT H/CRKR PLT 14	0417-X001-040	High Temp H2/H2S Corrosion (IS04)	3, 10	2
HV NEUT H/CRKR PLT 14	0417-X002-010	High Temp H2/H2S Corrosion (IS04)	5	1
HV NEUT H/CRKR PLT 14	0417-X002-020	High Temp H2/H2S Corrosion (IS04)	5	1
HV NEUT H/CRKR PLT 14	0417-X003-010	High Temp H2/H2S Corrosion (IS04)	5	1
HV NEUT H/CRKR PLT 14	0417-X003-020	High Temp H2/H2S Corrosion (IS04)	5	1
HV NEUT H/CRKR PLT 14	0417-X004-010	High Temp H2/H2S Corrosion (IS04)	5	1
HV NEUT H/CRKR PLT 14	0417-X009-040	Sulfidation (IS01)	3, 10	1
HV NEUT HC DIST PLT 15	0418-X001-010	Sulfidation (IS01)	5	1
HV NEUT HC DIST PLT 15	0418-X006-010	Sulfidation (IS01)	2.5	1
HV NEUT HC DIST PLT 15	0418-X006-020	Sulfidation (IS01)	2.5, 5	1
HV NEUT HC DIST PLT 15	0418-X006-050	Sulfidation (IS01)	10	2
HV NEUT HC DIST PLT 15	0418-X006-060	Sulfidation (IS01)	5	1
HV NEUT HC DIST PLT 15	0418-X006-070	Sulfidation (IS01)	5	1
HV NEUT HC DIST PLT 15	0418-X006-080	Sulfidation (IS01)	5	1
HV NEUT HC DIST PLT 15	0418-X007-030	Sulfidation (IS01)	5	1
HV NEUT HC DIST PLT 15	0418-X007-040	Sulfidation (IS01)	5	1
HV NEUT HC DIST PLT 15	0418-X008-010	Sulfidation (IS01)	5	1
HV NEUT HC DIST PLT 15	0418-X008-020	Sulfidation (IS01)	5	1
HV NEUT HC DIST PLT 15	0418-X008-030	Sulfidation (IS01)	5	1
HV NEUT HC DIST PLT 15	0418-X008-040	Sulfidation (IS01)	5	1
HV NEUT HC DIST PLT 15	0418-X014-010	Sulfidation (IS01)	10	2
HV NEUT HC DIST PLT 15	0418-X014-020	Sulfidation (IS01)	2.5, 10	2
HV NEUT HC DIST PLT 15	0418-X015-010	Sulfidation (IS01)	10	2
HV NEUT HC DIST PLT 15	0418-X015-020	Sulfidation (IS01)	2.5, 10	2
HV NEUT HC DIST PLT 15	0418-X015-030	Sulfidation (IS01)	10	2
HV NEUT HC DIST PLT 15	0418-X016-010	Sulfidation (IS01)	10	2
HV NEUT HC DIST PLT 15	0418-X016-020	Sulfidation (IS01)	5	1

HV NEUT HC DIST PLT 15	0418-X016-030	Sulfidation (IS01)	10	2
HC NEW H/C FINISH PLT 16	0419-X002-030	High Temp H2/H2S Corrosion (IS04)	5	1
HC NEW H/C FINISH PLT 16	0419-X003-020	High Temp H2/H2S Corrosion (IS04)	5	1
HC NEW H/C FINISH PLT 16	0419-X009-020	High Temp H2/H2S Corrosion (IS04)	5	1
HC NEW H/C FINISH PLT 16	0419-X009-030	High Temp H2/H2S Corrosion (IS04)	5	1
HC NEW H/C FINISH PLT 16	0419-X013-010	Sulfidation (IS01)	5	1
HC NEW H/C FINISH PLT 16	0419-X013-020	Sulfidation (IS01)	2.5, 5	1
HC NEW H/C FINISH PLT 16	0419-X013-030	Sulfidation (IS01)	5	1
HC NEW H/C FINISH PLT 16	0419-X017-010	Sulfidation (IS01)	10	2
HC NEW H/C FINISH PLT 16	0419-X017-020	Sulfidation (IS01)	10	2
HC NEW H/C FINISH PLT 16	0419-X023-010	Sulfidation (IS01)	10	2
HC NEW H/C FINISH PLT 16	0419-X023-020	Sulfidation (IS01)	2.5, 10	2
LT NEUT H/F DIST PLT 17	0420-X001-010	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT H/F DIST PLT 17	0420-X001-020	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT H/F DIST PLT 17	0420-X001-030	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT H/F DIST PLT 17	0420-X001-040	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT H/F DIST PLT 17	0420-X004-010	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT H/F DIST PLT 17	0420-X004-020	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT H/F DIST PLT 17	0420-X004-030	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT H/F DIST PLT 17	0420-X005-010	High Temp H2/H2S Corrosion (IS04)	10	2
LT NEUT H/F DIST PLT 17	0420-X005-020	High Temp H2/H2S Corrosion (IS04)	10	2
GAS RCY UNIT PLT 19	0422-X030-010	Sulfidation (IS01)	2.5,10	2
GAS RCY UNIT PLT 19	0422-X030-020	Sulfidation (IS01)	10	2
HYDROGEN PLANT – TRAIN 1 SOUTH	0441-X001-020	Sulfidation (IS01)	10	2
HYDROGEN PLANT – TRAIN 1 SOUTH	0441-X001-030	Sulfidation (IS01)	10	2
HYDROGEN PLANT –	0442-X001-020	Sulfidation (IS01)	10	2

TRAIN 2 NORTH				
HYDROGEN PLANT – TRAIN 2 NORTH	0442-X001-030	Sulfidation (IS01)	10	2
JET HYDROTREATER (JHT) PLT 2	0950-X026-010	High Temp H2/H2S Corrosion (IS04)	5	1
JET HYDROTREATER (JHT) PLT 2	0950-X026-060	High Temp H2/H2S Corrosion (IS04)	5	1
JET HYDROTREATER (JHT) PLT 2	0950-X026-070	High Temp H2/H2S Corrosion (IS04)	5	1
NO 5 NAPHTHA HYDROTREATER PLT 4	0951-X004-010	High Temp H2/H2S Corrosion (IS04)	5	1
NO 5 NAPHTHA HYDROTREATER PLT 4	0951-X005-010	High Temp H2/H2S Corrosion (IS04)	5	1
4 CRUDE UNIT PLT 11	0955-X003-080	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X003-090	Sulfidation (IS01)	2.5, 5	1
4 CRUDE UNIT PLT 11	0955-X004-030	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X004-040	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X004-050	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X004-060	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X004-070	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X012-010	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X012-030	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X012-040	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X012-080	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X014-010	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X014-020	Sulfidation (IS01)	10	2
4 CRUDE UNIT PLT 11	0955-X014-030	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X014-040	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X015-010	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X015-020	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X015-050	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X015-060	Sulfidation (IS01)	10	2
4 CRUDE UNIT PLT 11	0955-X016-010	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X016-020	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X017-010	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X017-020	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X017-030	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X017-040	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X017-050	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X017-J01	Sulfidation (IS01)	3	1
4 CRUDE UNIT PLT 11	0955-X020-010	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X020-020	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X021-010	Sulfidation (IS01)	5	1

4 CRUDE UNIT PLT 11	0955-X021-020	Sulfidation (IS01)	2.5, 5	1
4 CRUDE UNIT PLT 11	0955-X021-040	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X021-050	Sulfidation (IS01)	2.5, 5	1
4 CRUDE UNIT PLT 11	0955-X021-090	Sulfidation (IS01)	10	2
4 CRUDE UNIT PLT 11	0955-X022-010	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X022-020	Sulfidation (IS01)	2.5, 5	1
4 CRUDE UNIT PLT 11	0955-X022-030	Sulfidation (IS01)	5	1
4 CRUDE UNIT PLT 11	0955-X022-040	Sulfidation (IS01)	10	2
DIESEL HYDROTREATER (DHT) PLT 16	0956-X002-020	High Temp H2/H2S Corrosion (IS04)	5	1
DIESEL HYDROTREATER (DHT) PLT 16	0956-X002-030	High Temp H2/H2S Corrosion (IS04)	5	1
DIESEL HYDROTREATER (DHT) PLT 16	0956-X003-010	High Temp H2/H2S Corrosion (IS04)	5	1
GAS HYDROTREATER PLANT (GHT) 16.7	0963-X005-020	High Temp H2/H2S Corrosion (IS04)	5	1
GAS HYDROTREATER PLANT (GHT) 16.7	0963-X006-010	High Temp H2/H2S Corrosion (IS04)	5	1
GAS HYDROTREATER PLANT (GHT) 16.7	0963-X006-020	High Temp H2/H2S Corrosion (IS04)	5	1

ATTACHMENT 5
Reliability Program Update for Condition IV.D

CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
RELIABILITY PROGRAM § IV.D REPORT

December 29, 2022

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

Chevron U.S.A. Inc. ("CUSA" or "the Company") submits this report to comply with section IV.D of Appendix 4.13-PROG – Modernization Project Reliability Program, which provides:

> Chevron shall provide annual reports to the City summarizing the PHAs/revalidated PHAs completed during the preceding calendar year to account for consideration of damage mechanisms and shall include a list of fixed equipment inspection recommendations submitted for each turnaround, indicating which recommendations were accepted, and for those that were not accepted, the reason the recommendation was rejected. All PHAs shall be available for agency review pursuant to the terms of the RISO.

As reported in the 2017 IV.D report, pursuant to sections 4.13-4a, 4.13-7a, and 4.13-7b of the Monitoring Mitigation and Reporting Program (MMRP) and section IV.C of the Reliability Program prepared for the Refinery Modernization Project (Project), Process Hazard Analyses (PHAs), inclusive of inherently safer systems analyses (ISSAs), damage mechanism reviews (DMRs) and layers of protection analyses (LOPAs), were completed or revalidated for the following Project components in 2016:

- New Hydrogen Plant
- Modification to the FCC FHT (also referred to as the TKC)
- Modifications to the Sulfur Recovery Units (SRU)
- New No. 6 H2S Plant
- Hydrogen Compressor Upgrade project (HYCUP)

Chevron informed the City and CCHS of the availability of the PHAs and related materials via letter dated October 7, 2016. The PHAs and related materials from the Hydrogen Plant, TKC modifications, and No. 6 H2S Plant were reviewed by Contra Costa Health Services during an on-site visit and review of MMRP and Reliability Program requirements in August 2016. The PHA and related materials for the SRU modifications and HYCUP are available for review by the City and CCHS at the Refinery.

As previously stated in the 2018 report, reviews and updates were made to PHAs, ISSAs, DMRs, and LOPAs (or regulatory equivalent) for the following Project components in 2018:

- New Hydrogen Plant
- Modifications to TKC
- Hydrogen Compressor Upgrade project (HYCUP)
- Modifications to SRUs
- New 6H2S unit

The PHAs and related materials were reviewed by CCHS during on-site visits in May and August 2018, and CCHS verified that conditions MM 4.13-4a, MM 4.13-7a, MM 4.13-7b, and IV.C have been satisfied for purposes of commencement of Project operations. The documents are available for further review by the City and CCHS at the Refinery.

In 2019, planned turnarounds were completed at the TKC, as well as both SRU #1 and #2 Trains.

In 2020, reviews and updates were made to PHAs and/or LOPAs for the following components:

- New Hydrogen Plant
- SRU #1 and #2 Trains

A planned turnaround at SRU #1 was completed in 2020.

In 2021, reviews and updates were made to PHAs and/or LOPAs for the following components:

- New 6H2S Unit
- TKC Unit

A planned turnaround at SRU #2 was completed in 2021. A list of fixed equipment inspection recommendations for the turnaround is available for review by the City and CCHS at the Refinery.

In 2022, reviews and updates were made to PHAs and/or LOPAs for the following components:

- SRU #1 and #2 Trains

Planned turnarounds at the SRU #1 and the Hydrogen Train 1 were completed in 2022. A list of fixed equipment inspection recommendations for the turnaround is available for review by the City and CCHS at the Refinery.

ATTACHMENT 6
Reliability Program Report IV.F.2

CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
RELIABILITY PROGRAM § IV.F.2 REPORT

2022

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

Chevron U.S.A. Inc. ("CUSA" or "the Company") submits this report to comply with section IV.F.2 of Appendix 4.13-PROG – Modernization Project Reliability Program, which provides:

> Following commencement of Project operations, Chevron shall provide the City an annual report informing the City of any agency-initiated audits performed pursuant to the Richmond Industrial Safety Ordinance during the previous calendar year and shall update the City concerning the findings from and status of implementation of any recommendation that come out of such audits.

In 2022, Contra Costa Health Services (CCHS) performed a Richmond Industrial Safety Ordinance (RISO) audit at the Richmond Refinery from April 25 – June 2, 2022. The final report, including findings and status of implementation of recommendations, is published and maintained at the Refinery and can be made available upon request. The next audit is scheduled for 2025.

ATTACHMENT 7
Reliability Program Update for Condition IV.G

From: [redacted]
To: [redacted]
Cc: [redacted]
Subject: Chevron Refinery Annual Townhall-Follow-up to 12/21/2021 Discussion
Date: Thursday, December 30, 2021 5:03:00 PM
Attachments: Att.1 Modernization Project Reliability Program.pdf
Att.2 4.13-7a Reliability Program Report_2021.pdf
Att.3 2021 Tele Town Hall Transcript.pdf
Att.4 CSB Closure Letter.pdf
Att.5 MMRP 4.13-13d Twenty-Fourth Quarterly Report_Final.pdf
Att.6 4.13-7a Reliability Program Report_2018.pdf

Hi Lina,

Thank you again for meeting with Hakim and I to discuss the annual workforce and community townhall requirements set forth in Section IV.G of the Chevron Modernization Project Reliability Program. As agreed, the Refinery will not complete a community or workforce townhall in the 2022 calendar year since there is no new information to report concerning the Reliability Program requirements. This email memorializes our discussion and explains the justification for the agreement.

Section IV.G of the Reliability Program (Attachment 1) requires the following:
"On an annual basis following Project approval until such time as the City determines that such meetings are no longer required, Chevron shall hold town halls for its workforce and for the community to provide updates concerning:
(1) The status of the enhanced safety measures being implemented by the Refinery following the August 6, 2012 fire, including actions taken to implement the recommendations made by public agencies that investigated the August 6 incident.
(2) The status and/or results of the material upgrades, inspection and monitoring program, and ongoing compliance with the Richmond Industrial Safety Ordinance, including Project-related PHAs, DMRs, LOPAs, and ISSAs.
(3) When triggered, the results of the reliability review revalidation and the status of any recommendations made as a result of this review".

As reported in Chevron's 2021 Annual Compliance Report, which included the 2021 Reliability Program Report (Attachment 2), the Reliability Program has been fully implemented (with a few exceptions related to work required to be completed during forthcoming turnarounds). Regarding the three topics required to be addressed by Section IV.G, there is no new information to be reported in 2022 that is different from what was reported in the 2021 Reliability Program Report or the 2021 community (Attachment 3) and workforce townhalls. Specifically:

1. On January 20, 2021 the U.S. Chemical Safety Board responded and closed the final recommendation (Recommendation No, 2012-3-I-CA-UR2) with the status "Closed-Acceptable Action"(Attachment 4). Further, all corrective actions taken to implement agency recommendations and as a result of Chevron's internal investigation have been implemented and, where required, integrated into Chevron's maintenance and operating procedures**.** Therefore, all corrective actions are closed. As such, there will be no new or additional information to report as it relates to recommendations and/or corrective actions taken following the August 2012 fire. The Refinery submitted its twenty-fourth and final Quarterly Crude Fire Corrective Action Status Report (MM 4.13-13d) under the quarterly reporting requirement on March 31, 2021 (Attachment 5).

2. The required material upgrades (piping circuits, partial piping circuits, valve replacements)

identified in III.A of the Reliability Program were completed in 4Q2016. CCHS reviewed the documents demonstrating compliance in August of 2018. A final update on the status of these replacements was submitted in August 2018 and included in the 2018 Reliability Program Report (Attachment 6) . It was also reported out to the community during the 2018 and 2019 Annual Community Townhalls. Since the commencement of operations (April 17, 2019), no additional piping circuits have been replaced. The Refinery reports annually to the City summarizing the monitoring and inspection results for the identified circuits (i.e., IV.B report), which is included in the Annual Reliability Program Report and available for public review. All pre-construction and post construction project PHAs were completed and this update was provided in the 2019, 2020 and 2021 Annual Community Townhalls. Follow-up PHAs in accordance with the RISO are conducted every 5 years and are subject to required triennial external audits from the CCHSD. With the exception of five internal inspections remaining, which will be completed during the next scheduled turnarounds for the associated unit(s) as required, there are no further updates available to provide to the community or workforce.

3. To date, the Modernization Project has not triggered the requirement to complete a reliability review revalidation, and the soonest this requirement could be triggered would be following the forthcoming 2022 operational year.

Given the status of these three topics, we have agreed that further community or workforce townhalls serve no informational purpose at this time. Consistent with current practice, the Refinery will continue to include any updates in accordance with section IV.G of the Reliability Program as part of the in the Annual Reliability Program Report due 9/1 of each reporting year. Moving forward, Chevron will work with the City to include these updates as part of City Staff's report to the Planning Commission regarding the Modernization Project Annual Compliance Report. Further, the need to complete a community and/or workforce townhall for 2023 (and future years) will be re-evaluated during the Annual Compliance Report discussions.

Thank you for your consideration and approval of this path forward.

ATTACHMENT 8
Monthly Local Hire Reports
Operational Year 2022

human energy®

modernization project monthly hires report

chevron richmond refinery
January 2022

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1 purpose

In accordance with the Local Content Agreement and Environmental and Community Investment Agreement dated August 4, 2014, for the Richmond Refinery Modernization Project, Chevron U.S.A. Inc. (“CUSA”) is providing this monthly update on local hiring.

2 training and workforce readiness programs

Chevron continues to support programs to train residents of Richmond and unincorporated North Richmond for work at the Richmond Refinery and on the Modernization Project.

3 local hiring

Chevron continues to work with construction contractors and non-construction suppliers in attempt to employ Richmond residents on the Modernization Project. Section 4. A. (3) (c) of the ECIA states, “The requirements of sections (a) and (b) shall not apply to hours of work performed by residents of states other than the State of California, and such hours shall not be considered determining satisfaction of percentage requirements described herein.”. Therefore, the following metrics are for the State of California.

3.1 Metrics

Below are the ECIA, Section 4. A. (3) (b) metrics for the State of California.

Table 1: Modernization Hires

Table 2: Percentage Richmond Domiciled Modernization Hires

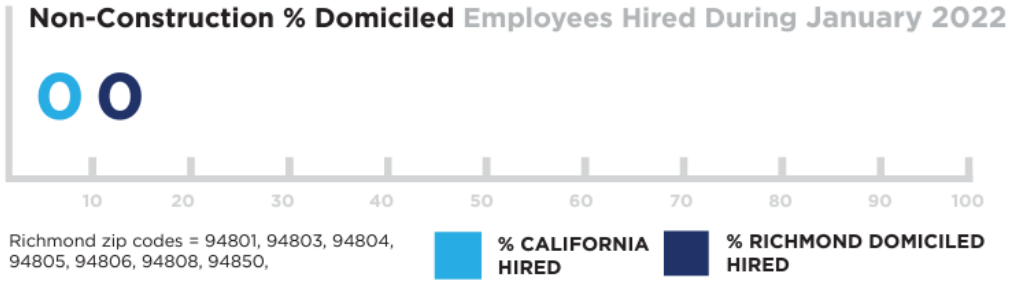


Table 4: Wage Bill

These amounts are for all our core construction contractors, primary subcontractors and non-construction contractors which includes Richmond Domiciled and California hires from June 2016 to the current reporting month.

Table 5: Community Programs

Table 6: Cumulative Modernization Hires

Table 7: Cumulative Percentage Richmond Domiciled Modernization Hires

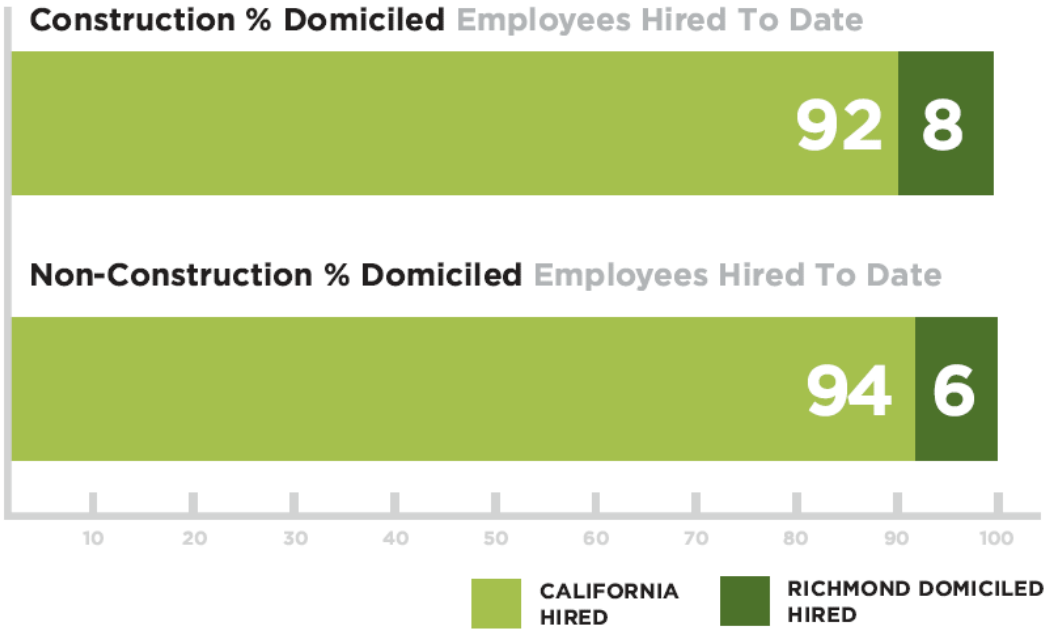
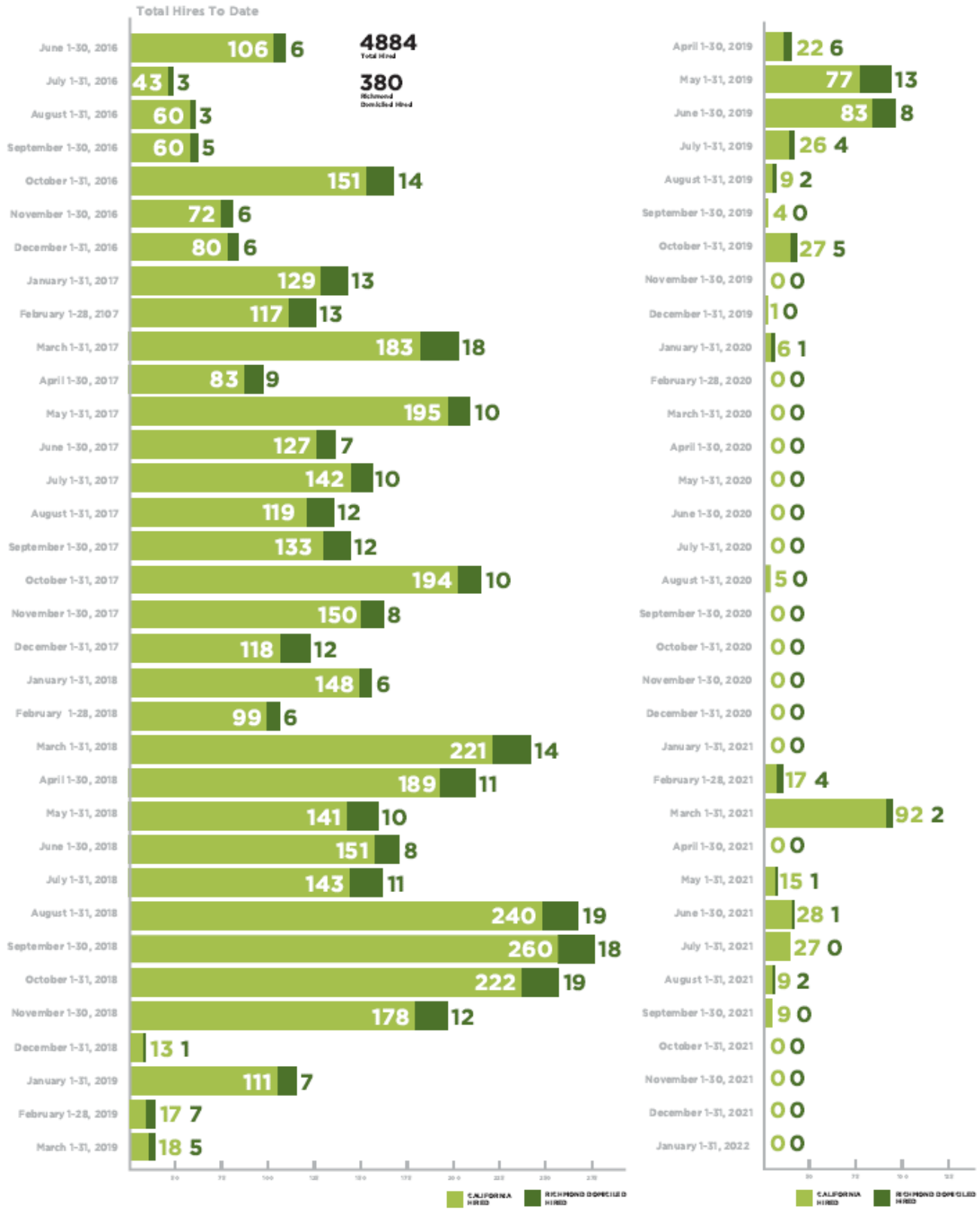


Table 8: Total Modernization Hires



human energy®

modernization project monthly hires report

chevron richmond refinery
February 2022

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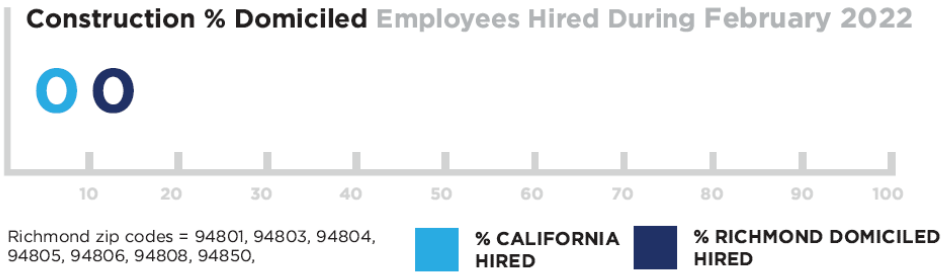


Table 3: No new hires for February 2022

Table 4: Wage Bill

These amounts are for all our core construction contractors, primary subcontractors and non-construction contractors which includes

Table 5: Community Programs

Table 6: Cumulative Modernization Hires

Table 7: Cumulative Percentage Richmond Domiciled Modernization Hires

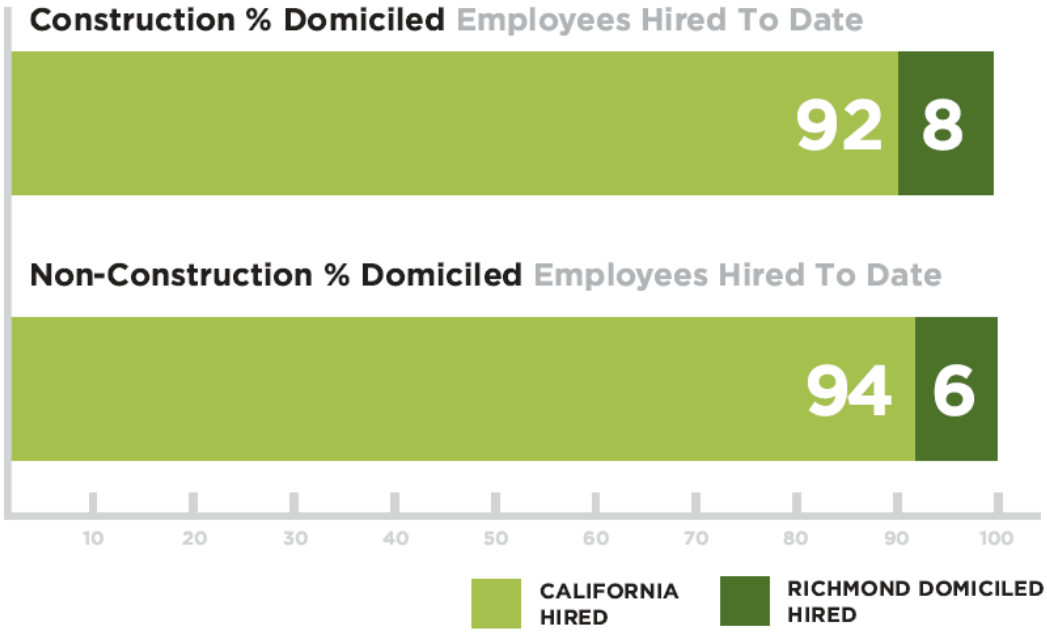
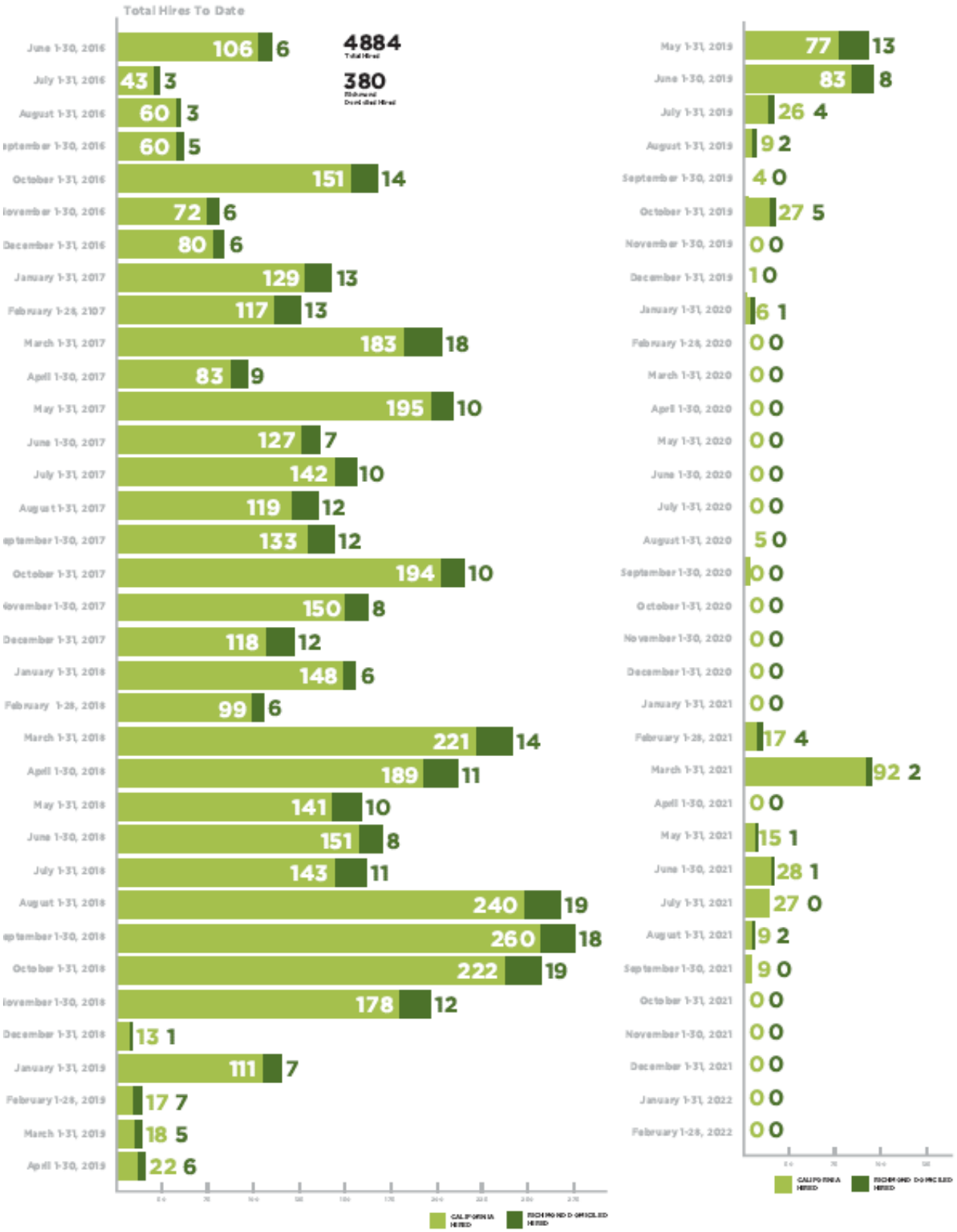


Table 8: Total Modernization Hires



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chevron richmond refinery
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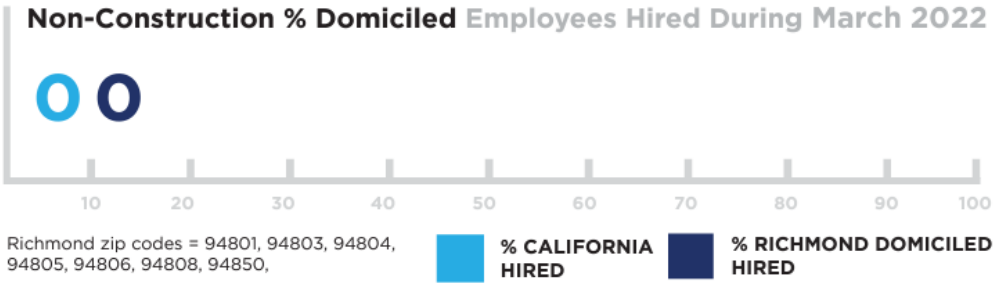


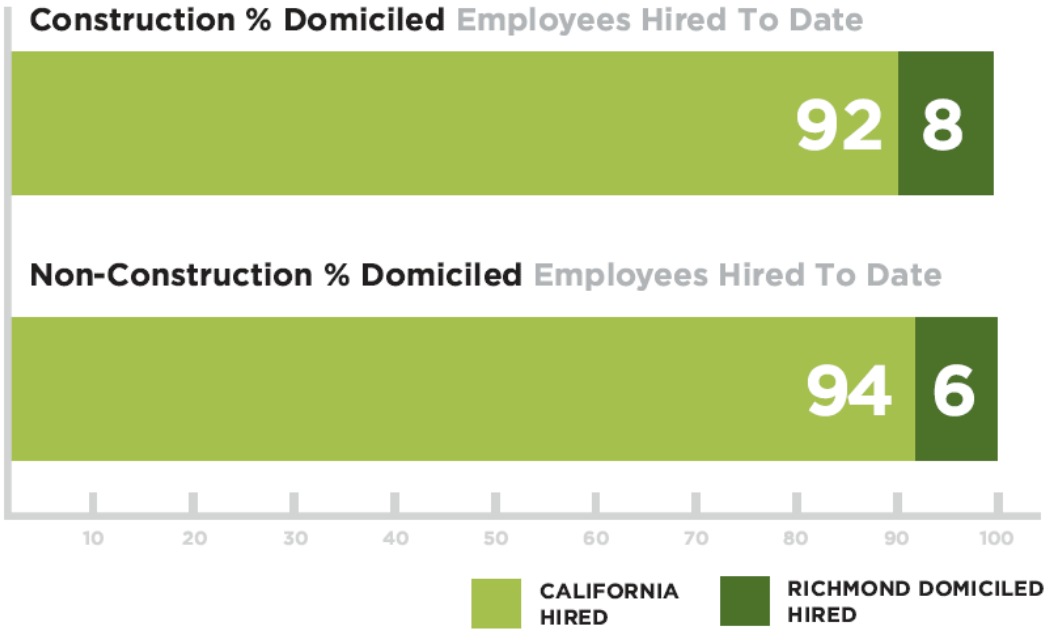
Table 3: No new hires for March 2022

Table 4: Wage Bill

Table 5: Community Programs

Table 6: Cumulative Modernization Hires

Table 7: Cumulative Percentage Richmond Domiciled Modernization Hires



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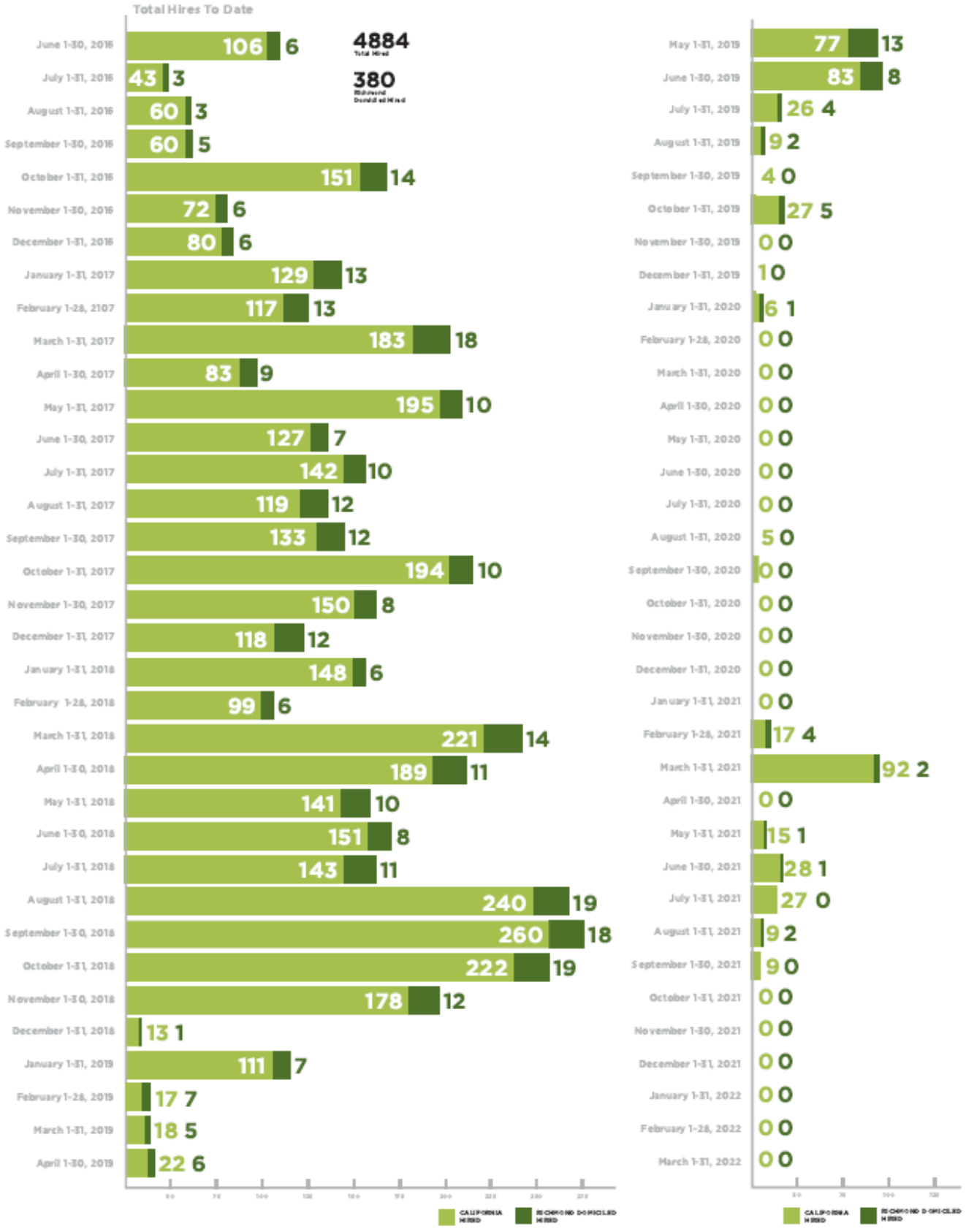

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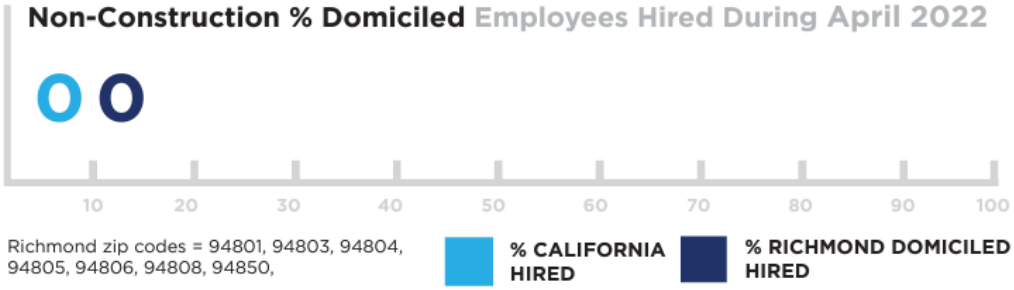

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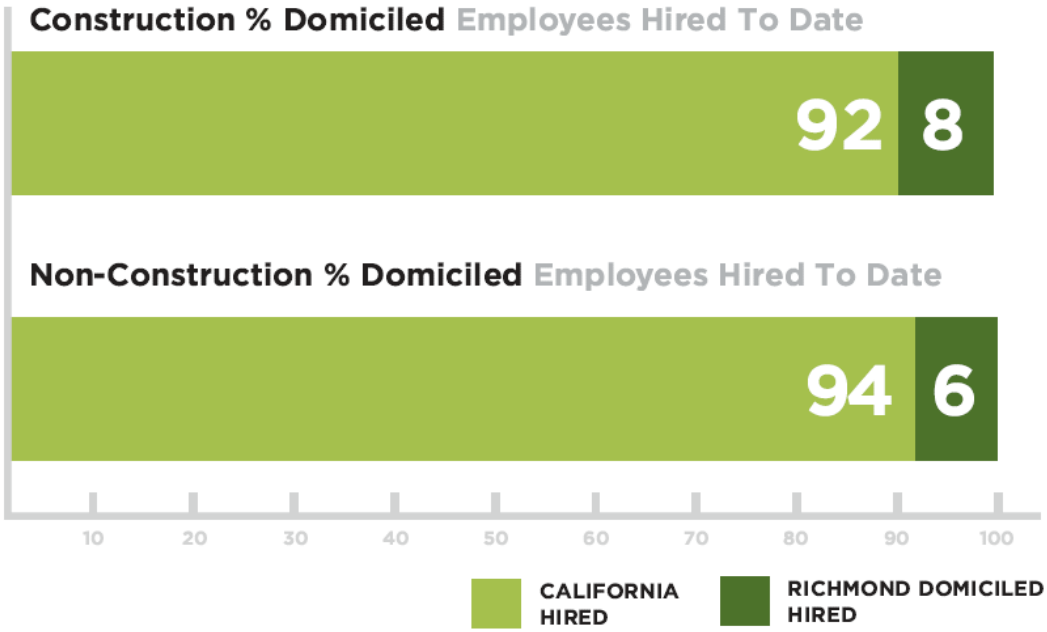

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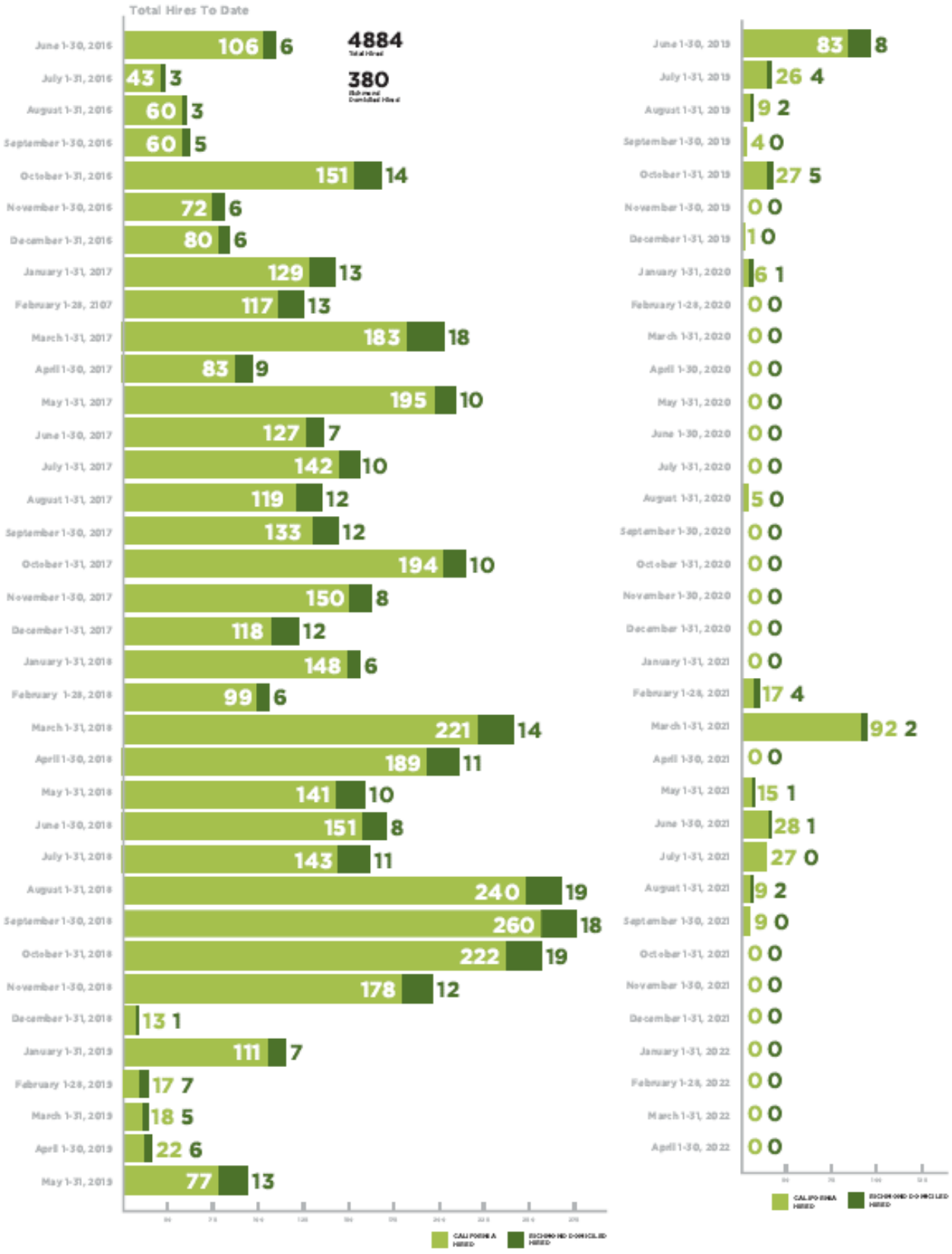

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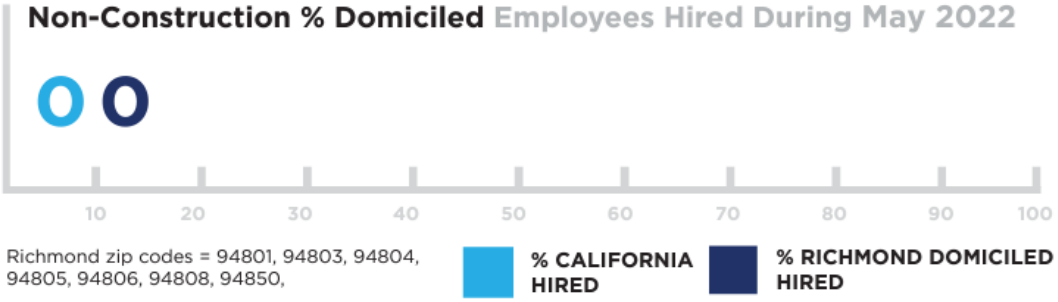

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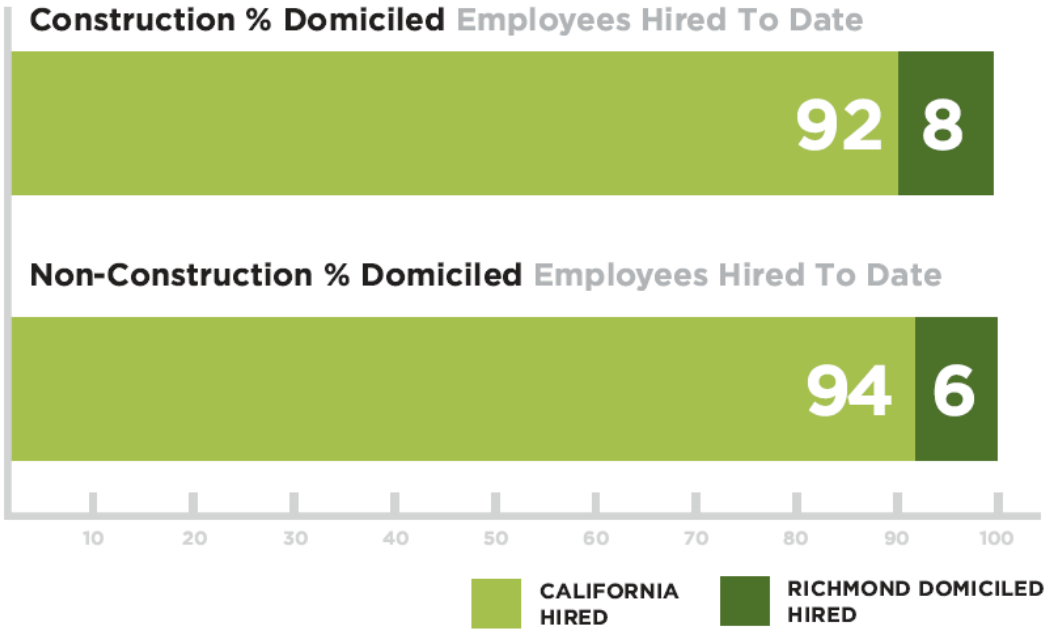

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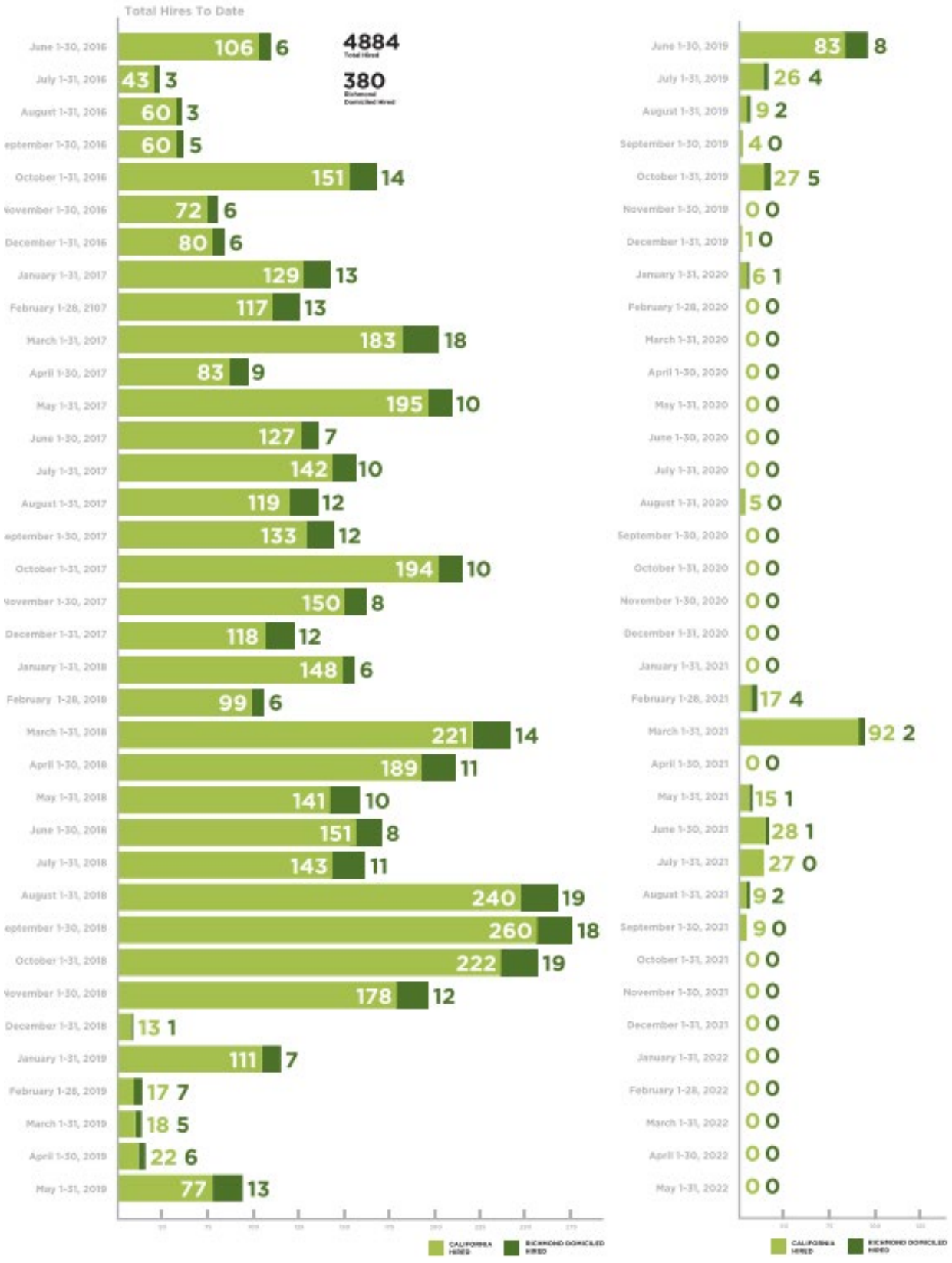

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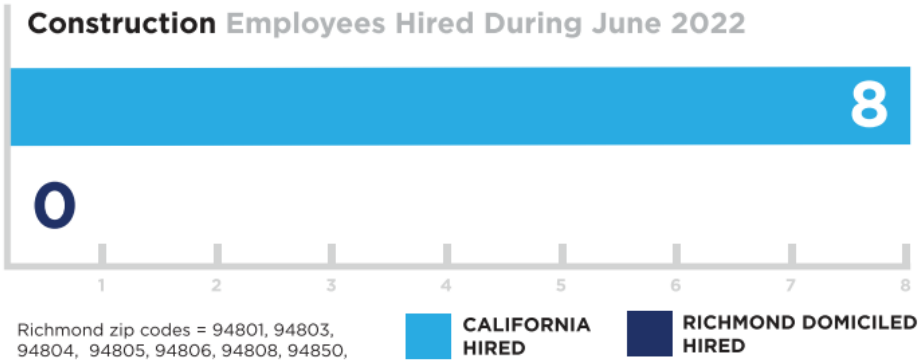

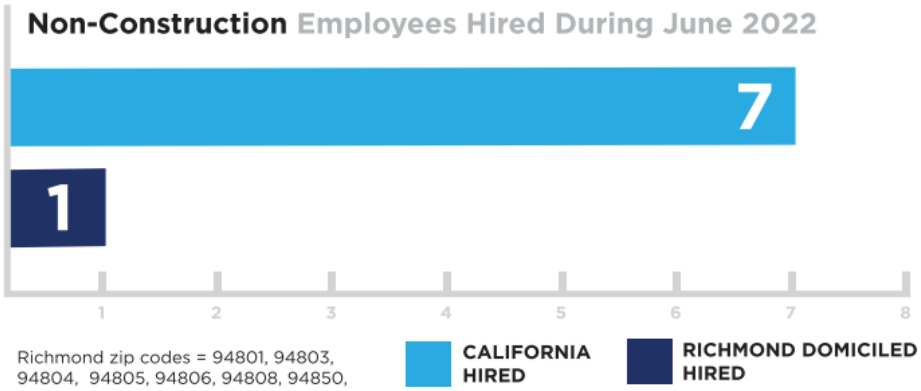

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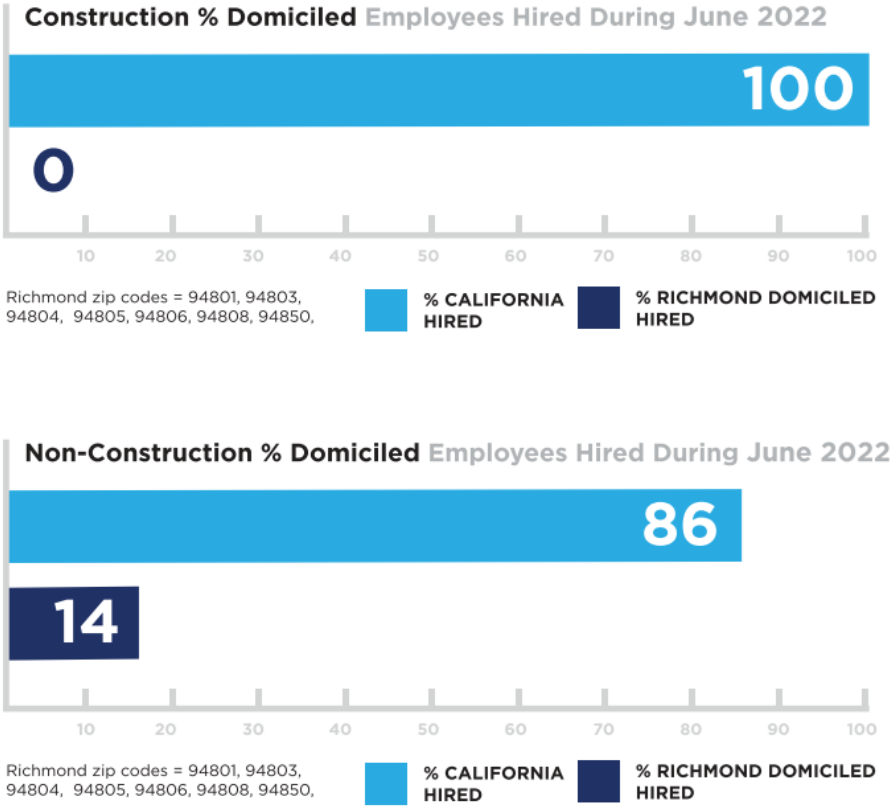

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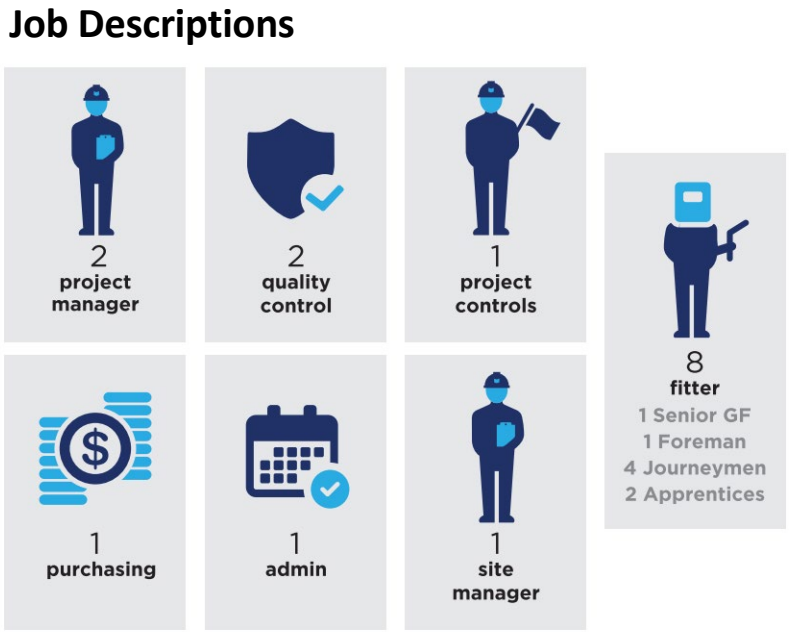

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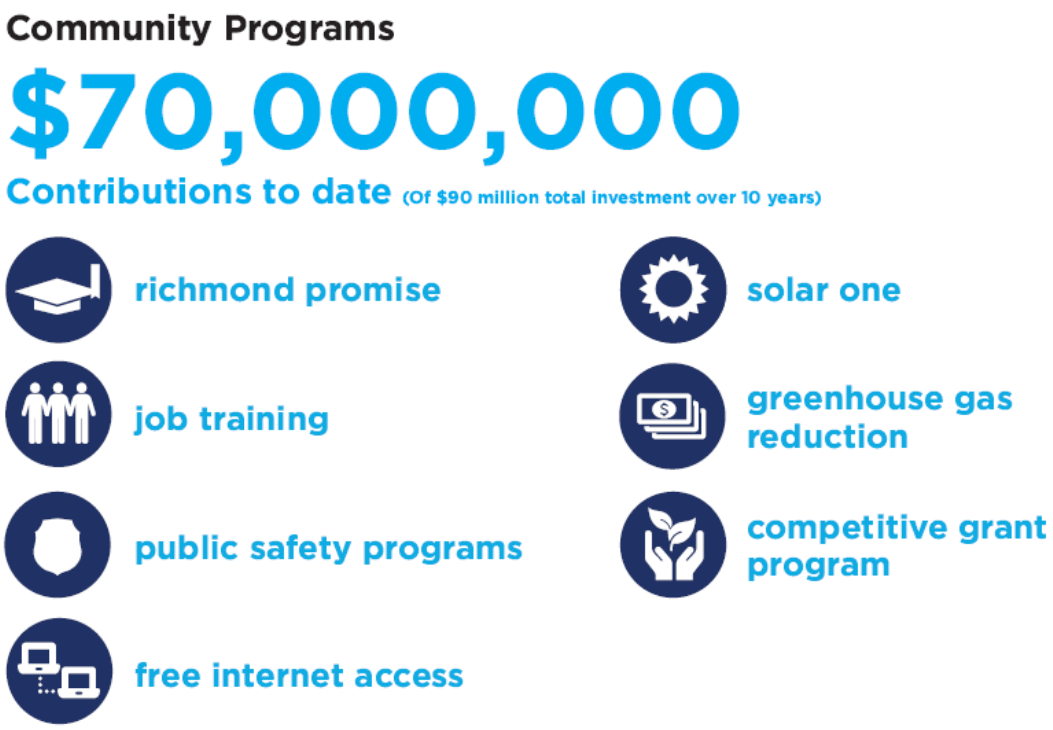

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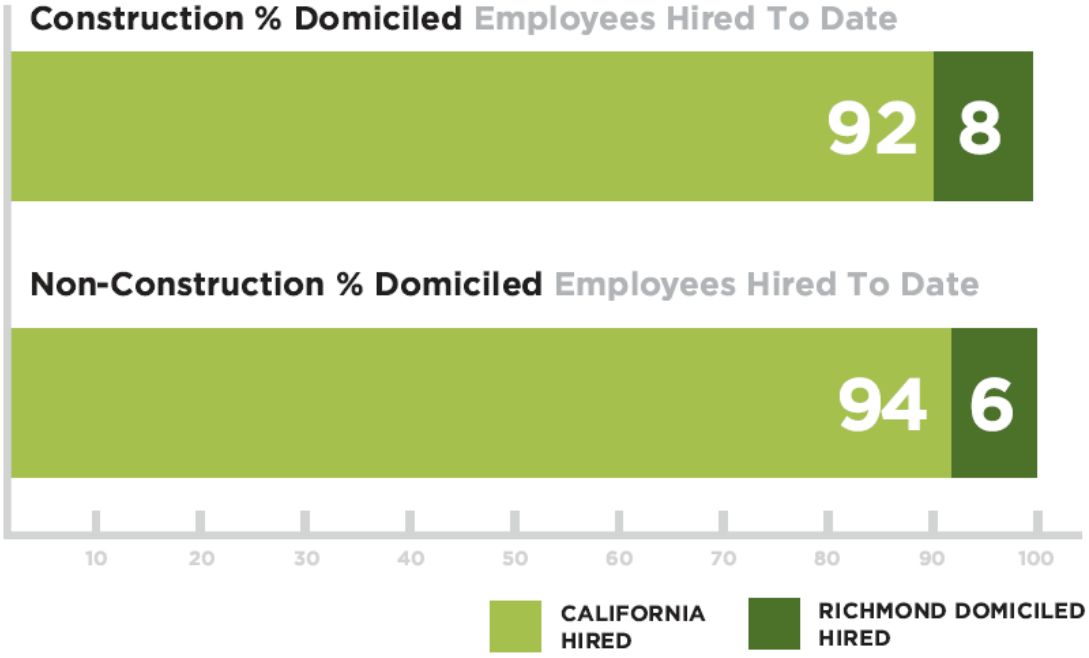

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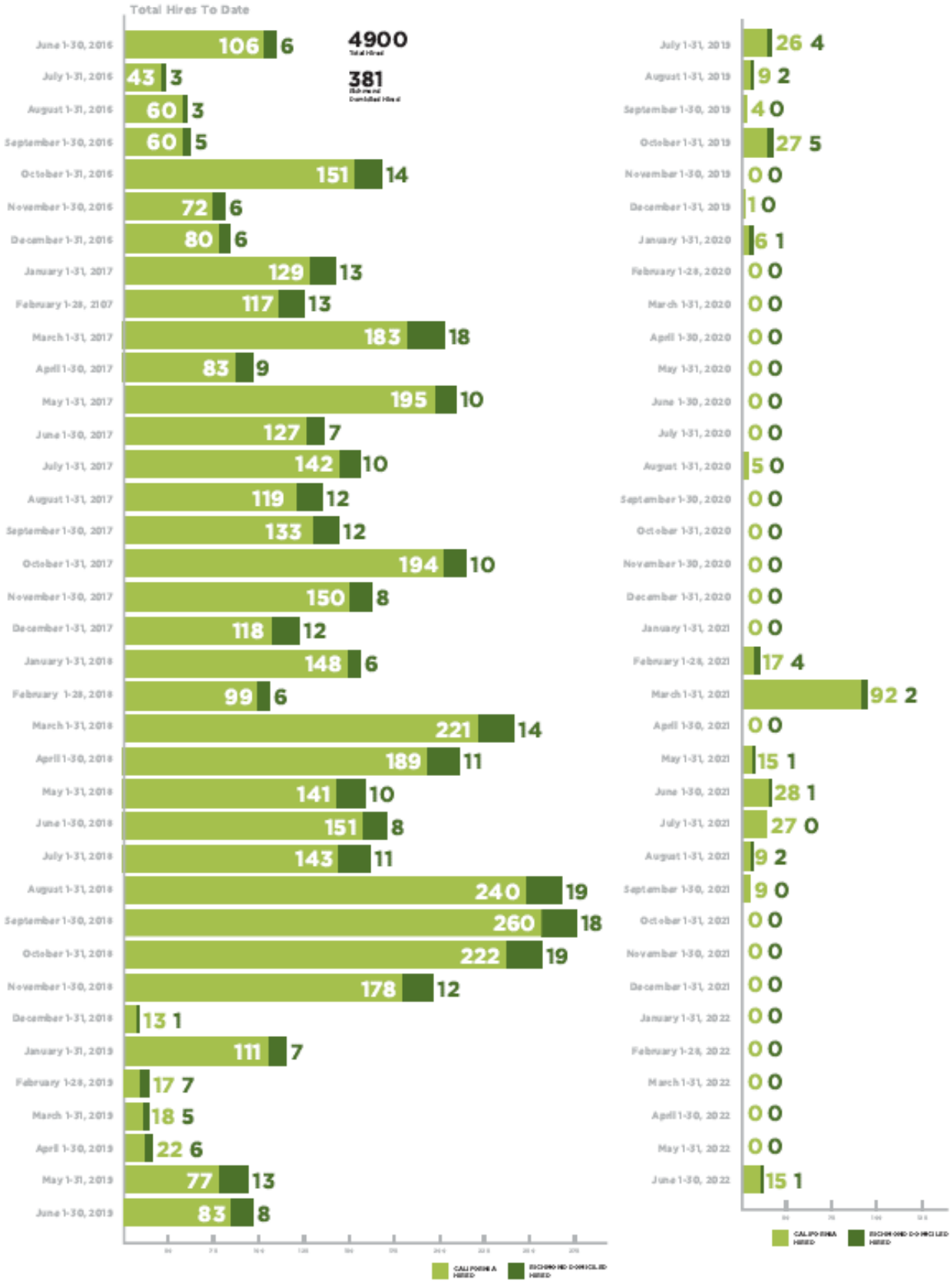

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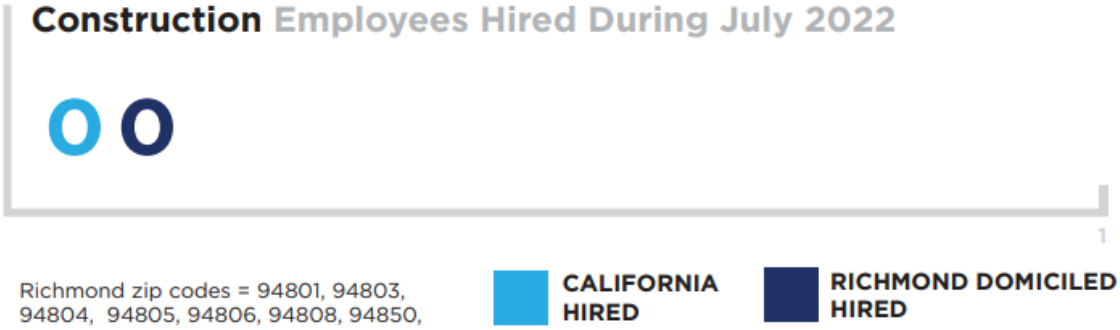

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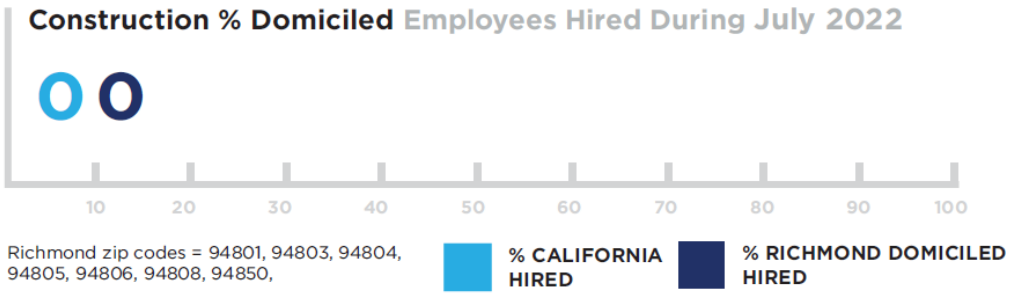

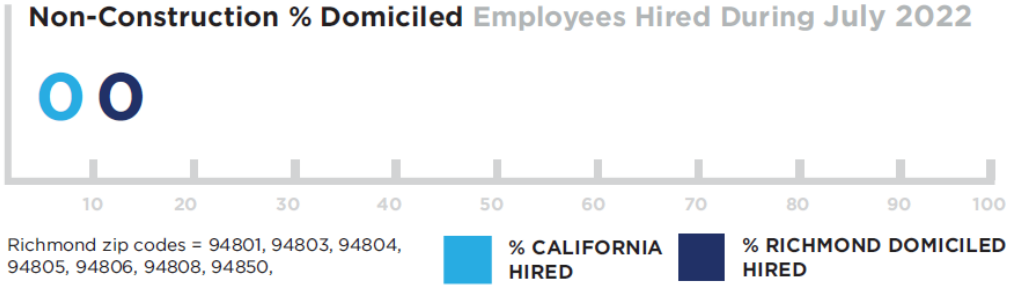

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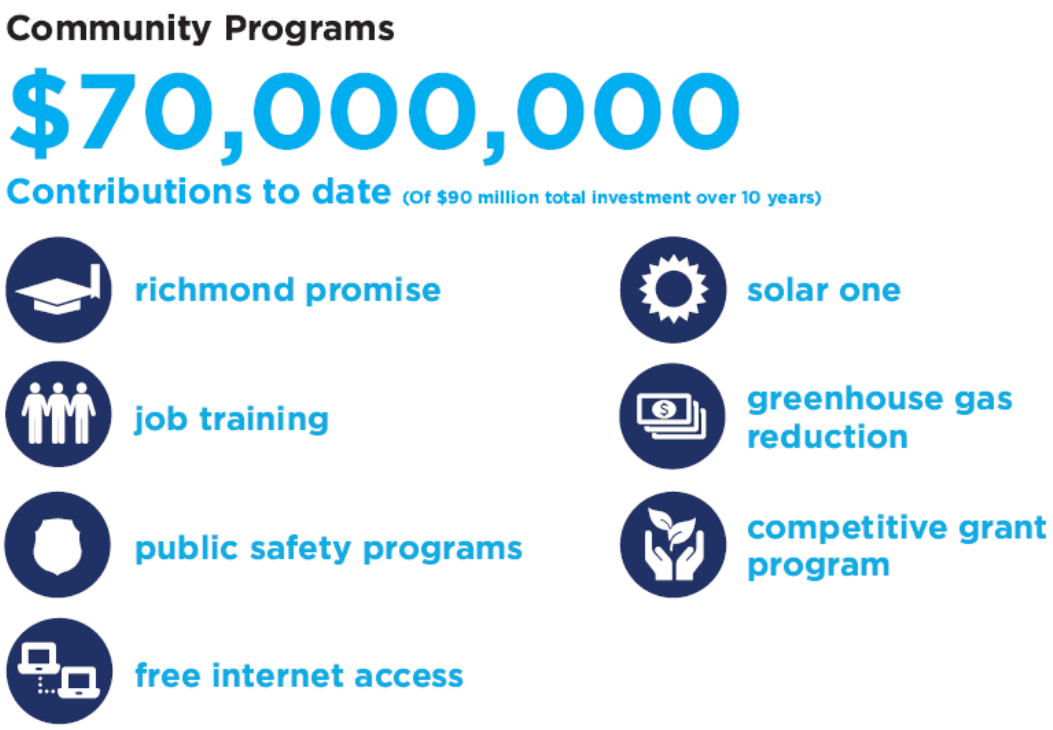

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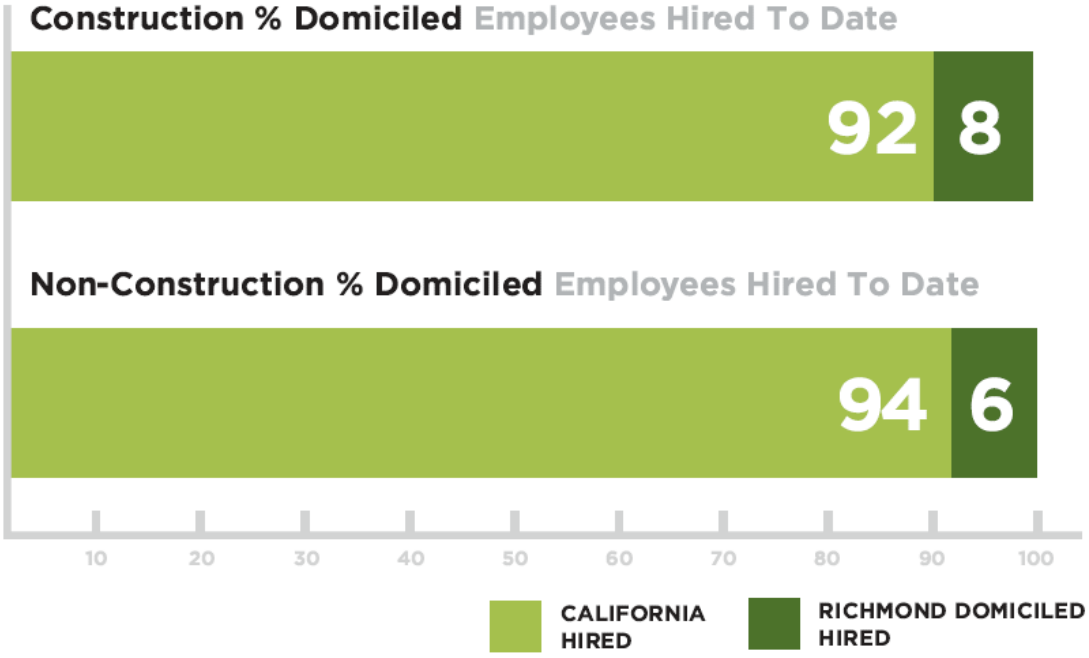

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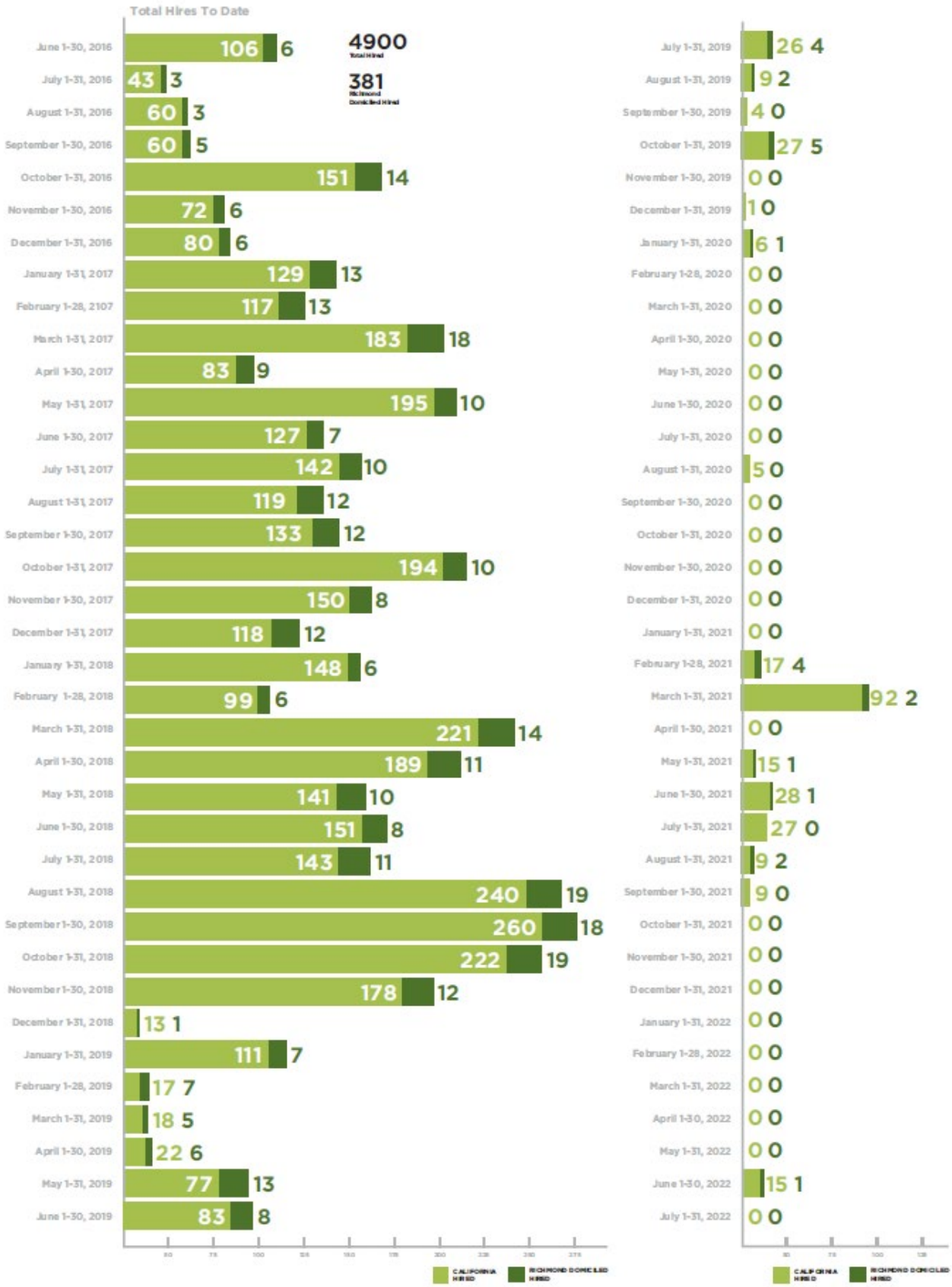

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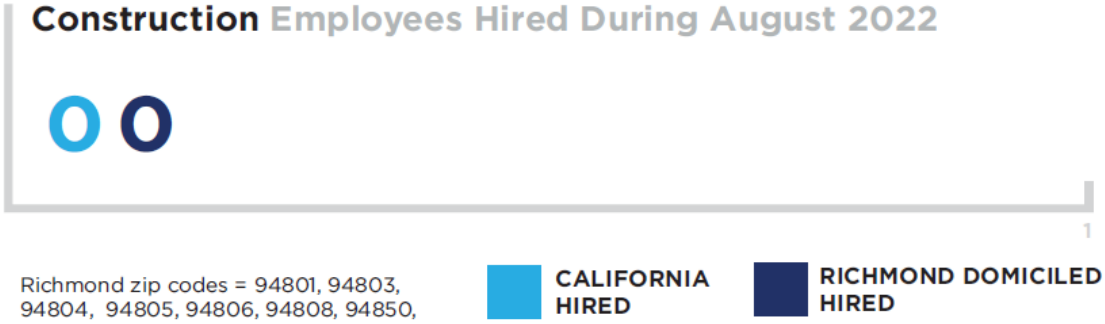

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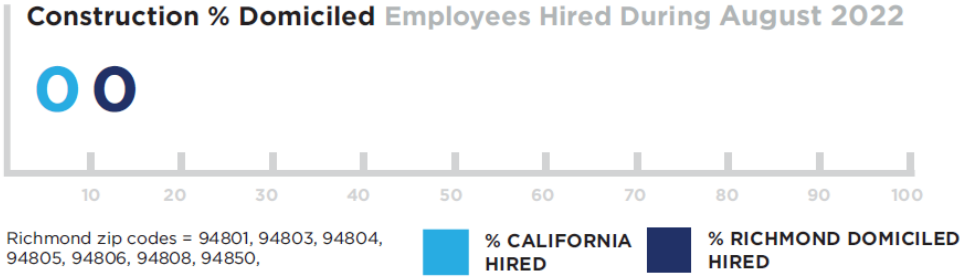

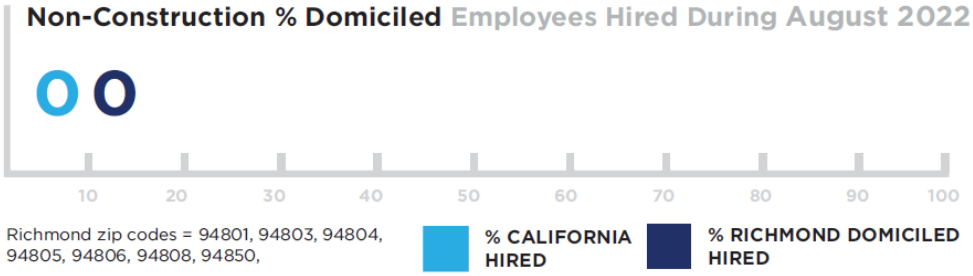

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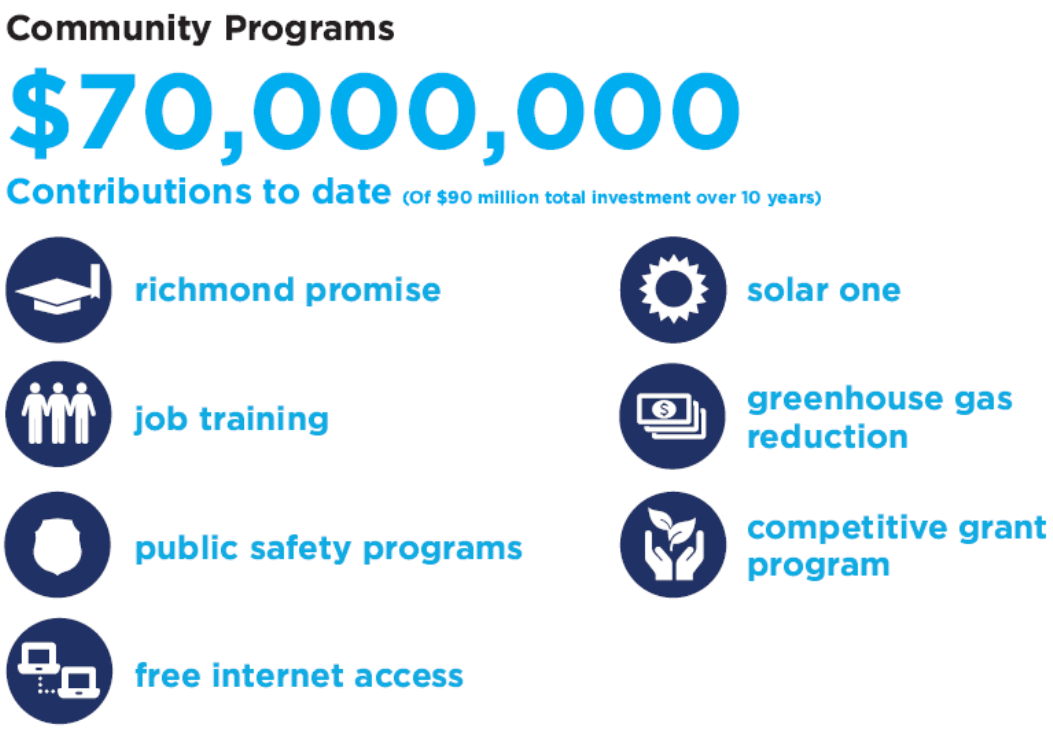

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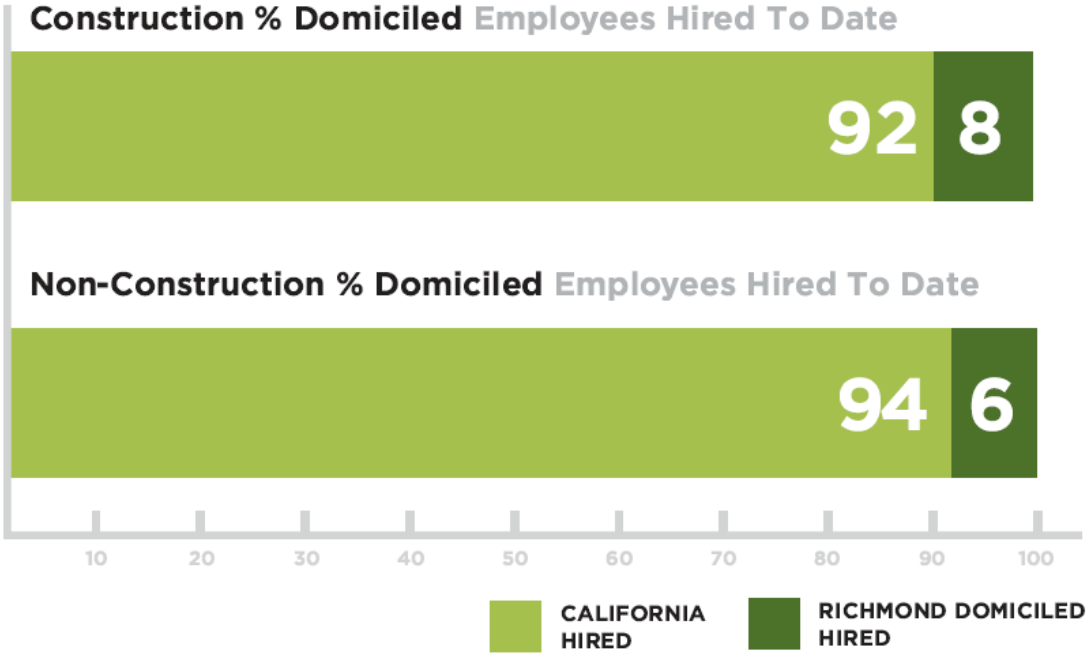

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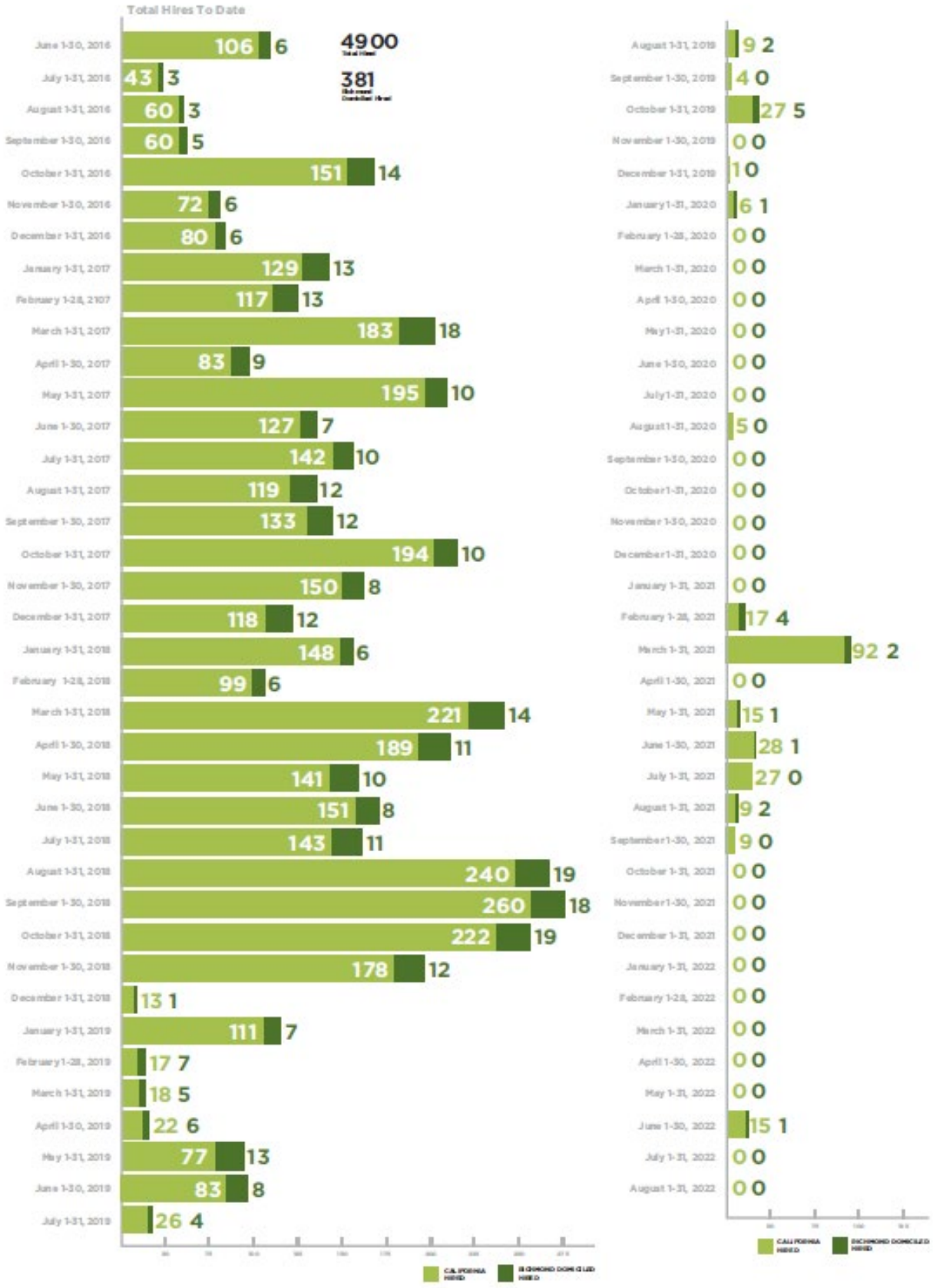

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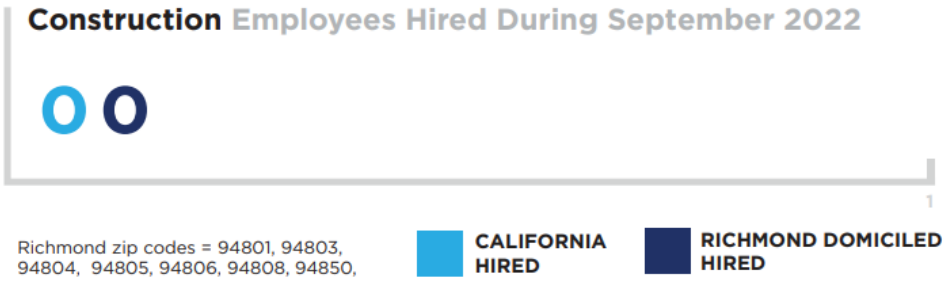

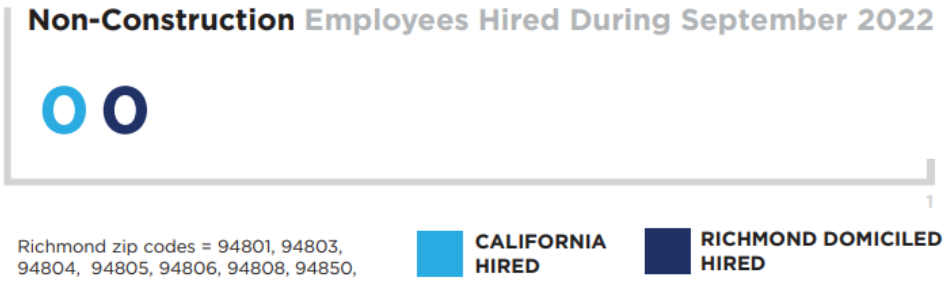

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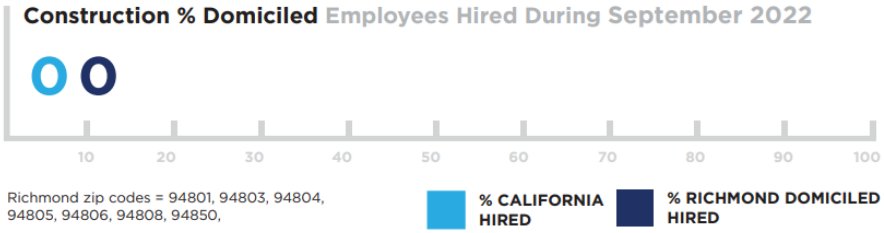

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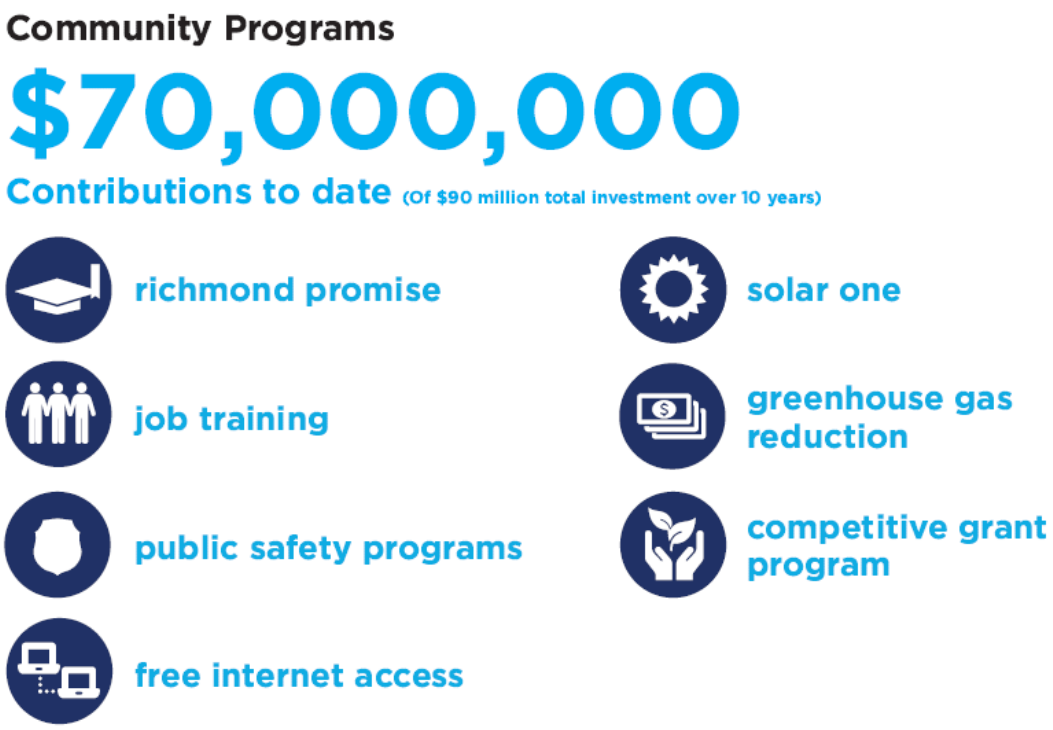

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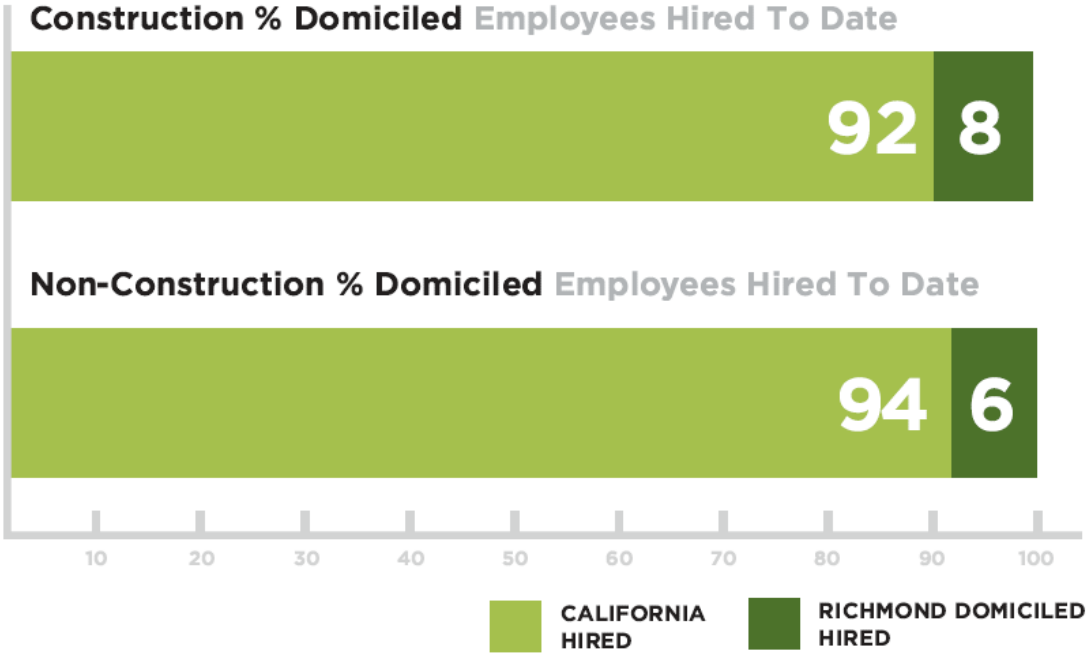

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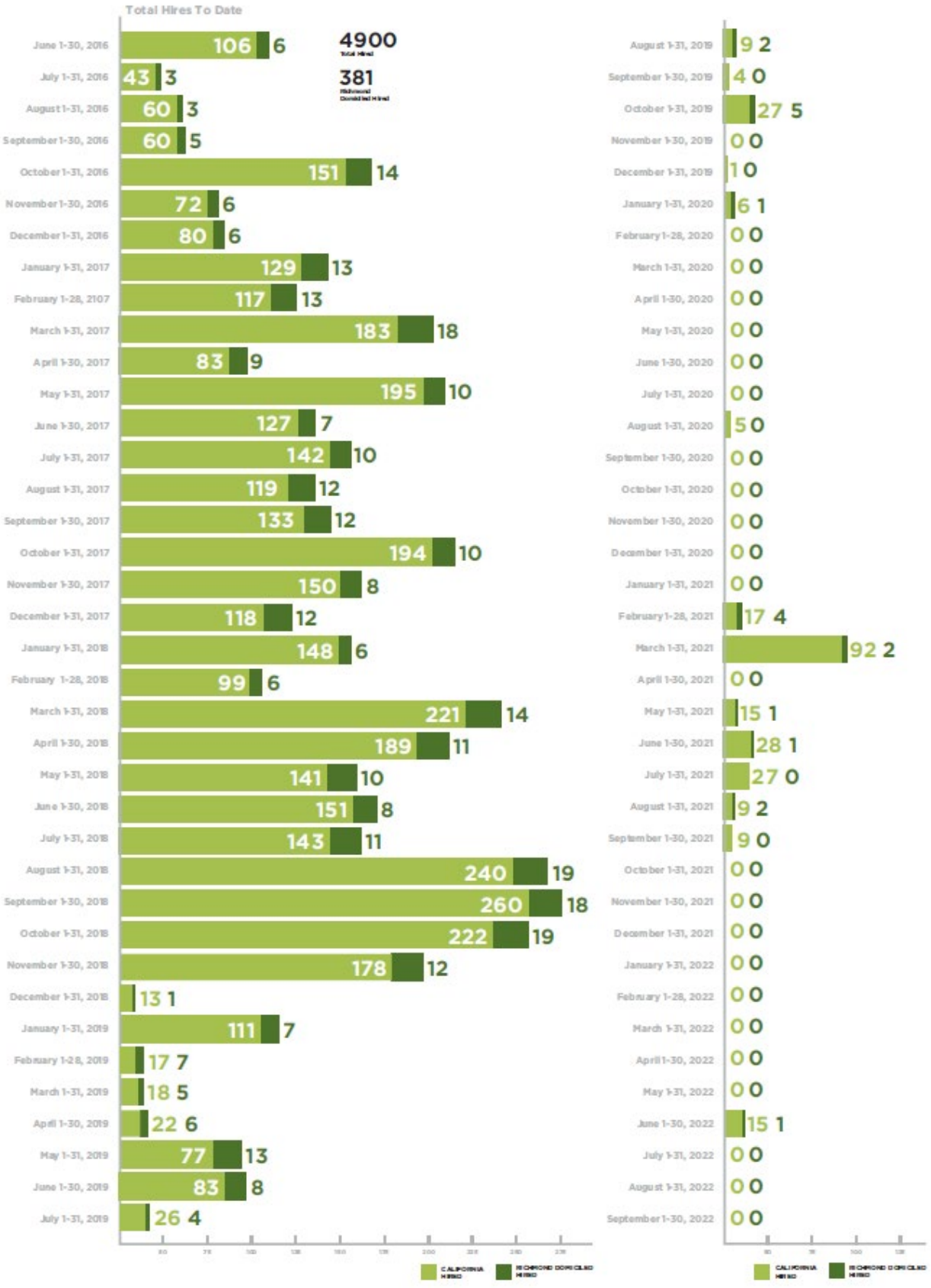

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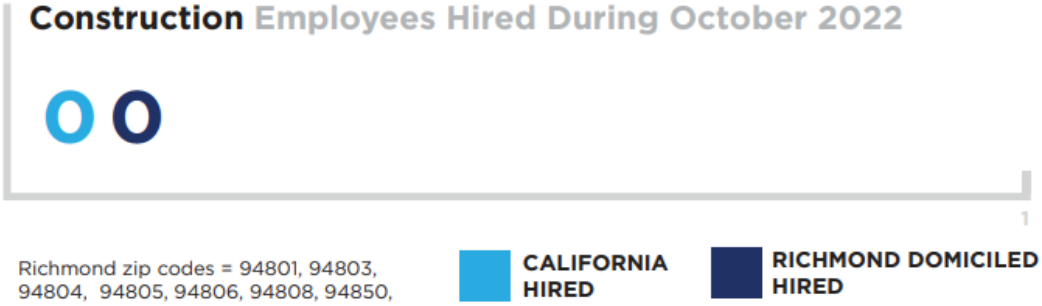


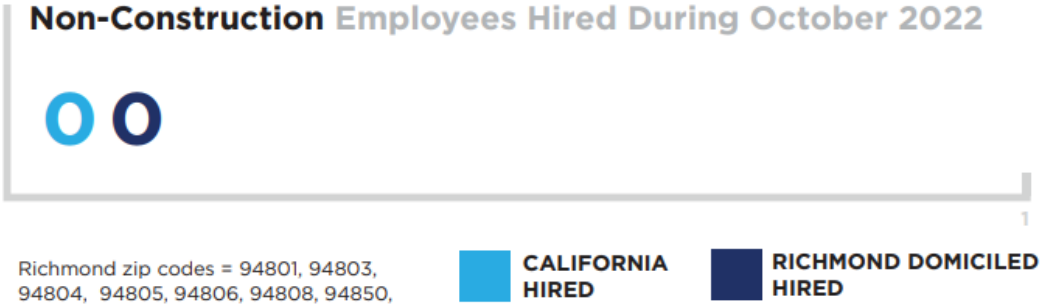


Table 2: Percentage Richmond Domiciled Modernization Hires

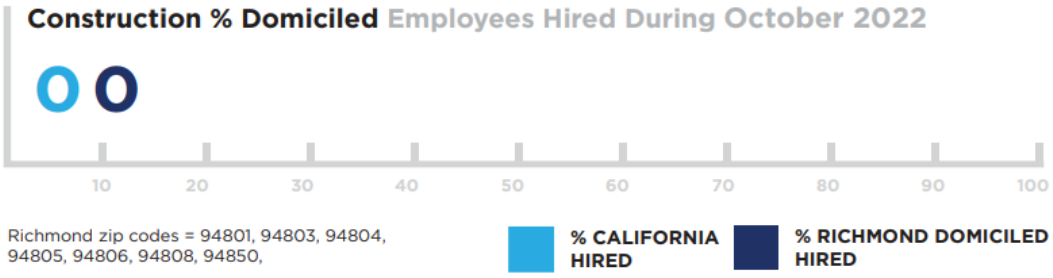


Table 3: Modernization Project Jobs

October 2022 – No data

Table 4: Wage Bill

These amounts are for all our core construction contractors, primary subcontractors and non-construction contractors which includes Richmond Domiciled and California hires from June 2016 to the current reporting month.

Table 5: Community Programs

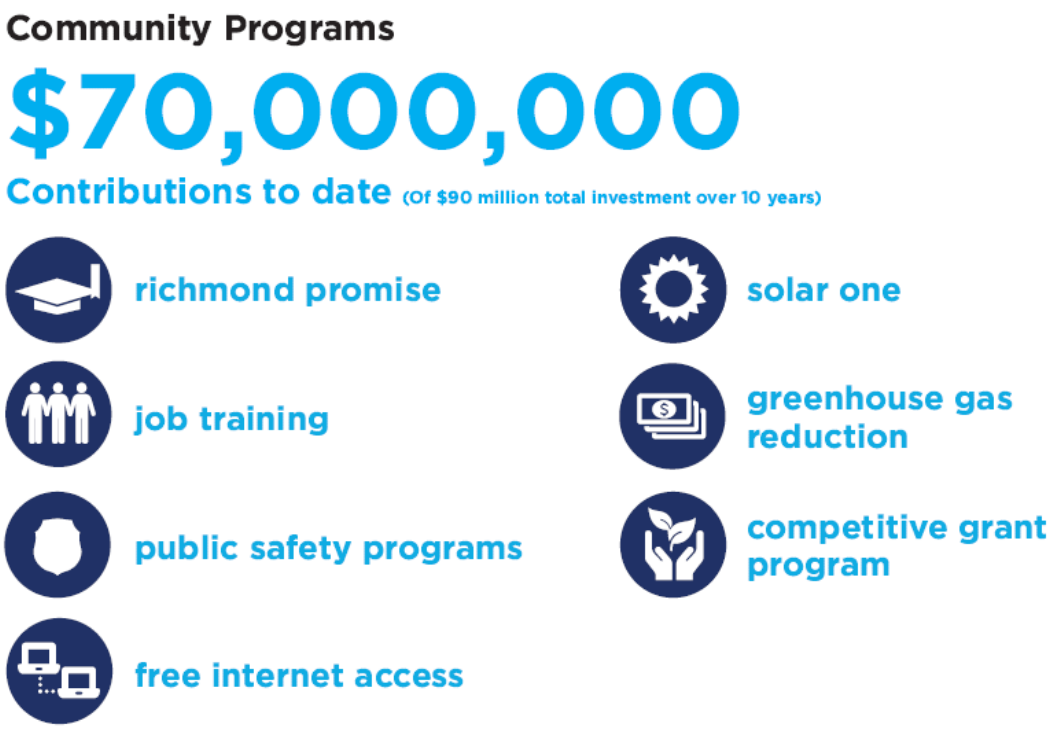


Table 6: Cumulative Modernization Hires

Table 7: Cumulative Percentage Richmond Domiciled Modernization Hires

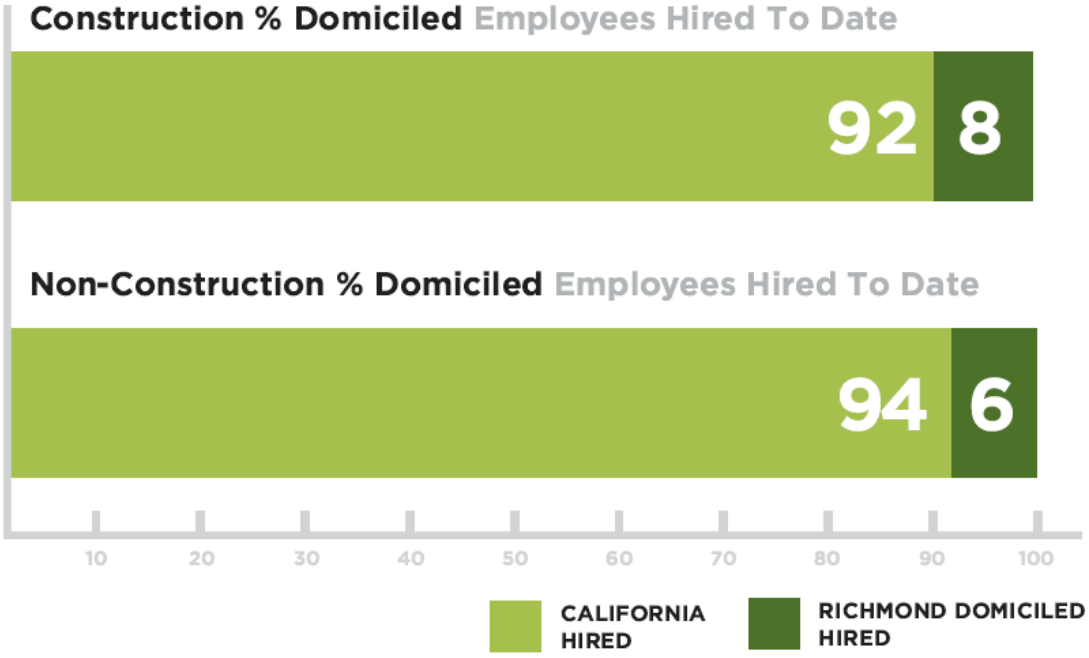
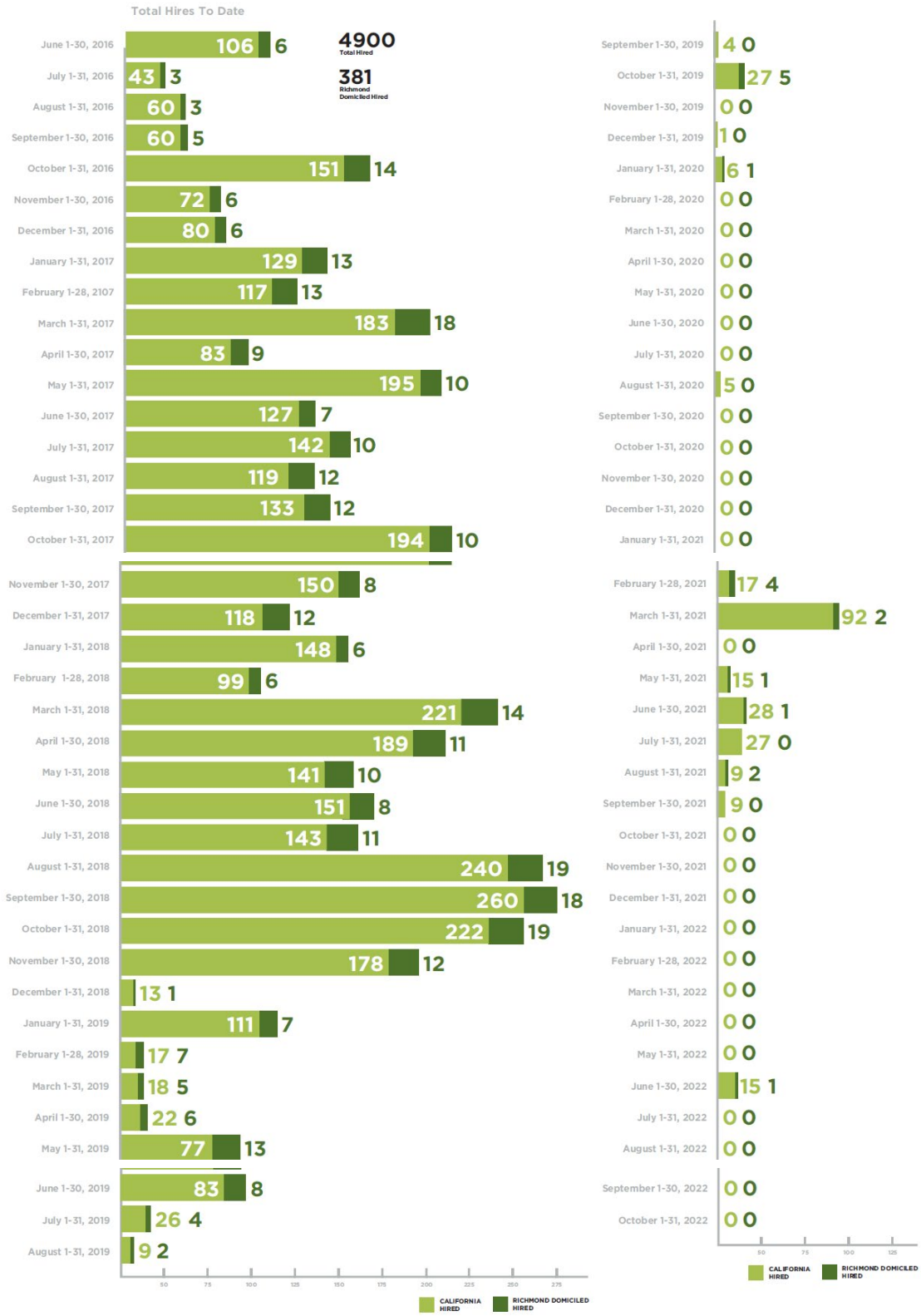


Table 8: Total Modernization Hires



human energy®

modernization project monthly hires report

chevron richmond refinery
November 2022

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1 purpose

In accordance with the Local Content Agreement and Environmental and Community Investment Agreement dated August 4, 2014, for the Richmond Refinery Modernization Project, Chevron U.S.A. Inc. (“CUSA”) is providing this monthly update on local hiring.

2 training and workforce readiness programs

Chevron continues to support programs to train residents of Richmond and unincorporated North Richmond for work at the Richmond Refinery and on the Modernization Project.

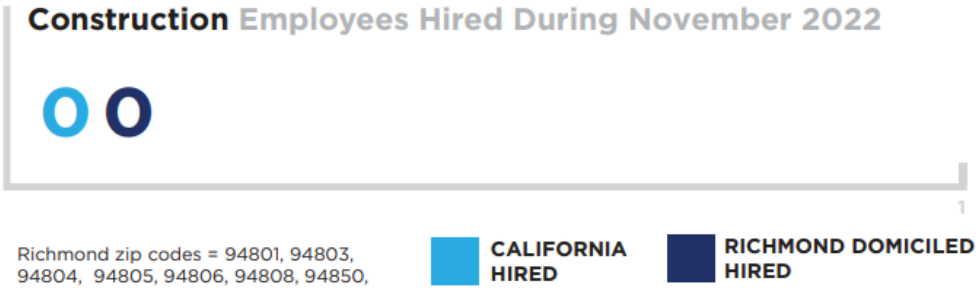
3 local hiring

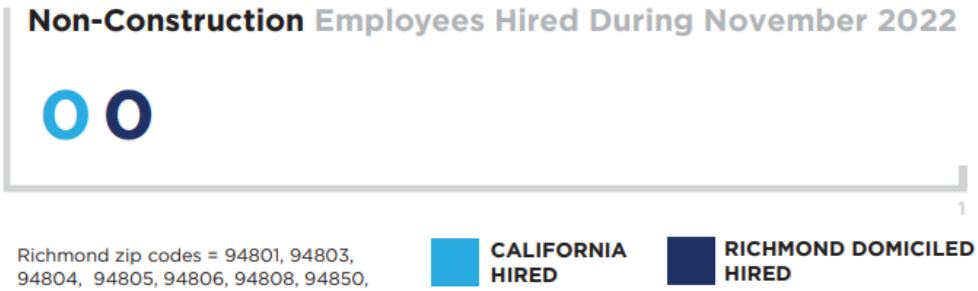
Chevron continues to work with construction contractors and non-construction suppliers in attempt to employ Richmond residents on the Modernization Project. Section 4. A. (3) (c) of the ECIA states, “The requirements of sections (a) and (b) shall not apply to hours of work performed by residents of states other than the State of California, and such hours shall not be considered determining satisfaction of percentage requirements described herein.”. Therefore, the following metrics are for the State of California.

3.1 Metrics

Below are the ECIA, Section 4. A. (3) (b) metrics for the State of California.

Table 1: Modernization Hires





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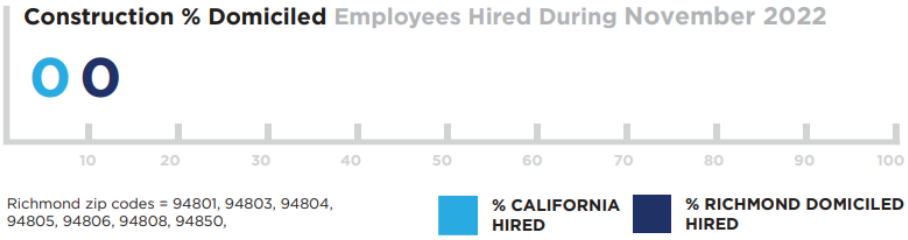

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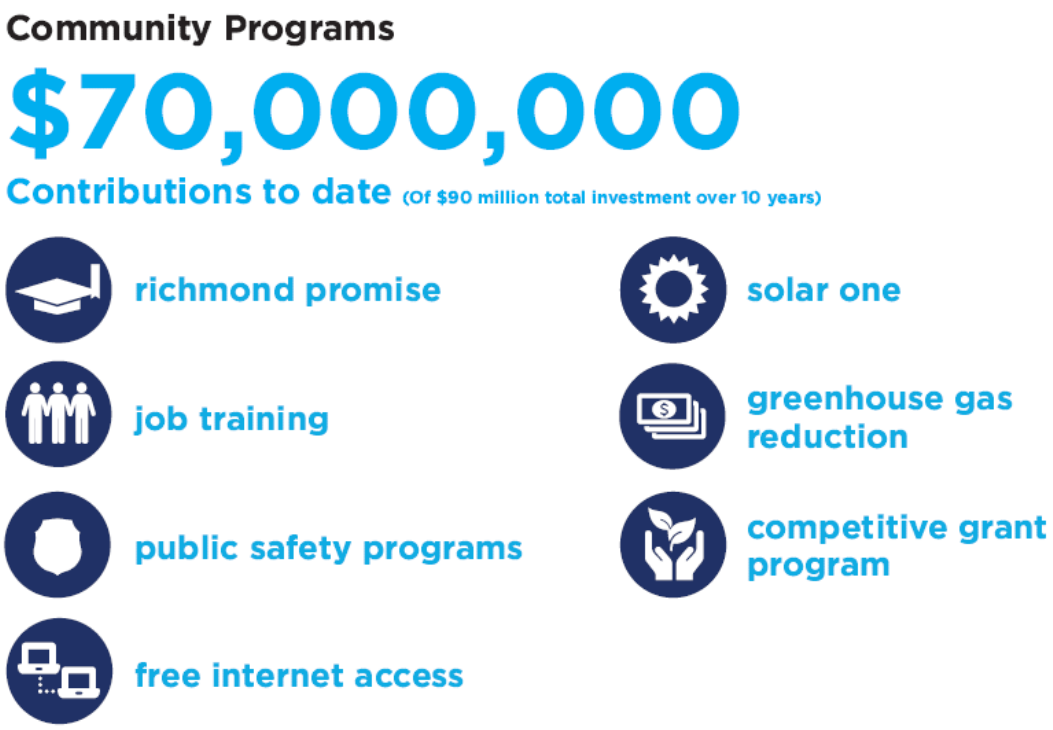

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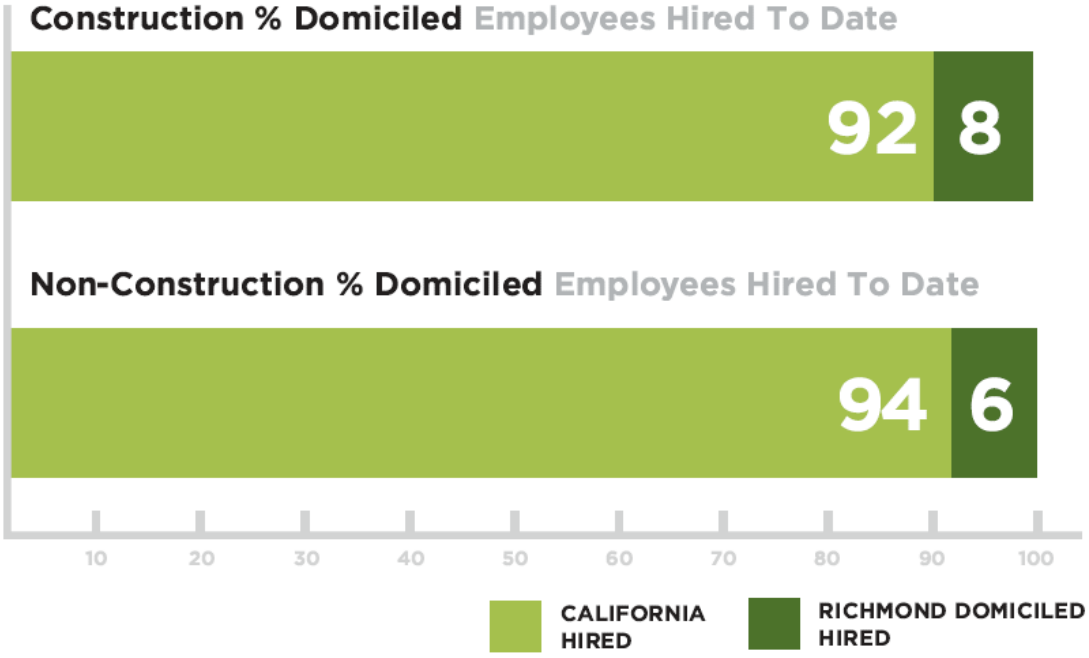

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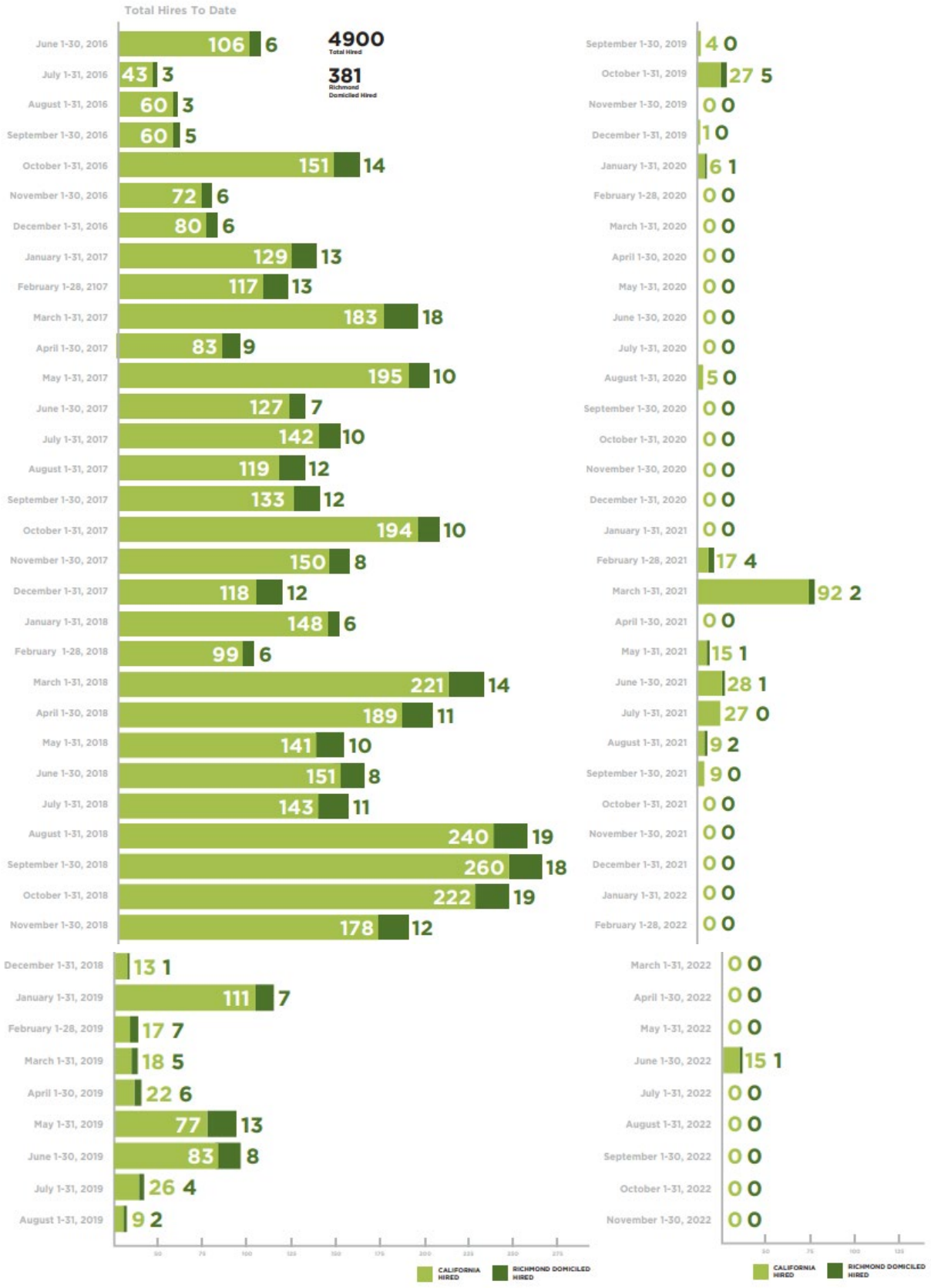

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modernization project monthly hires report

chevron richmond refinery
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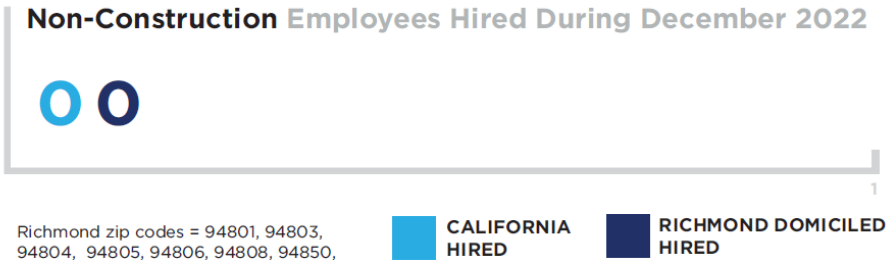

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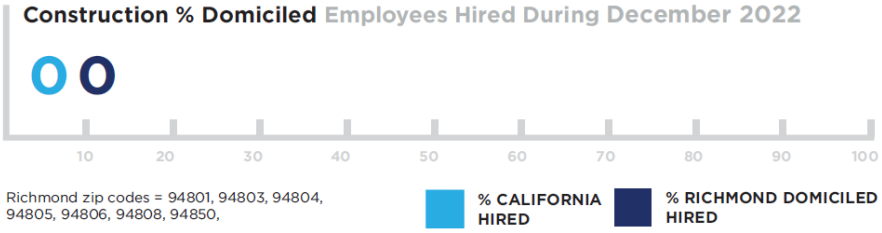

Table 3: Modernization Project Jobs

December 2022 – No data

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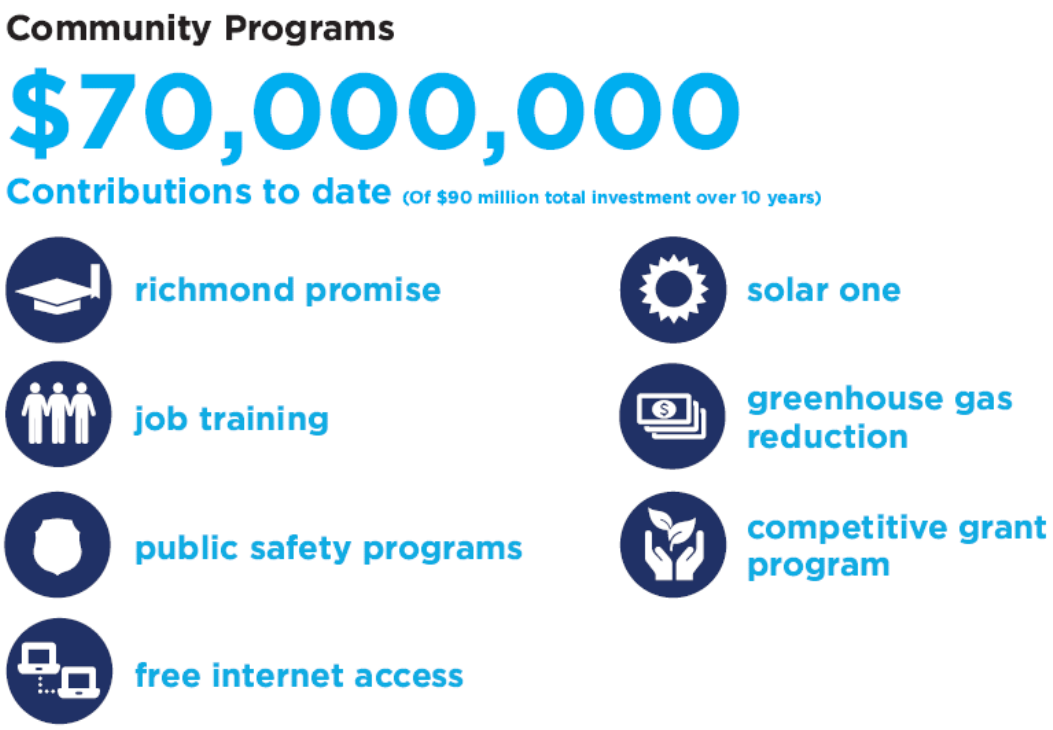

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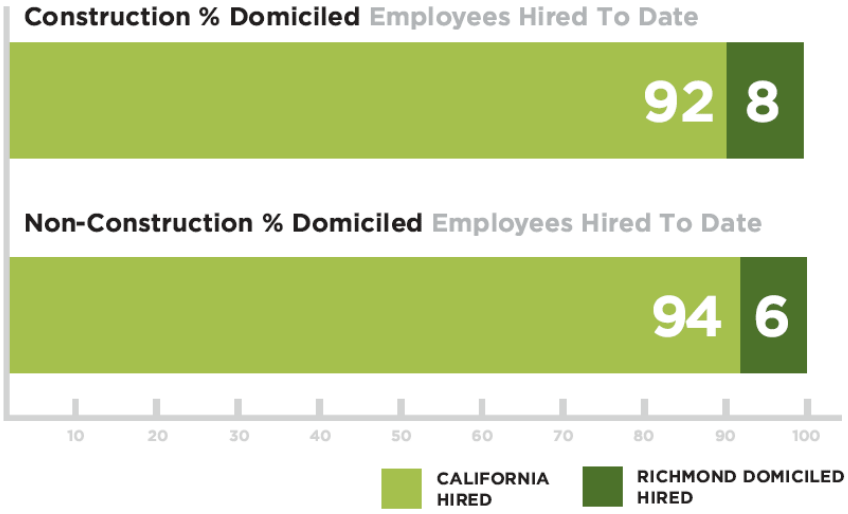

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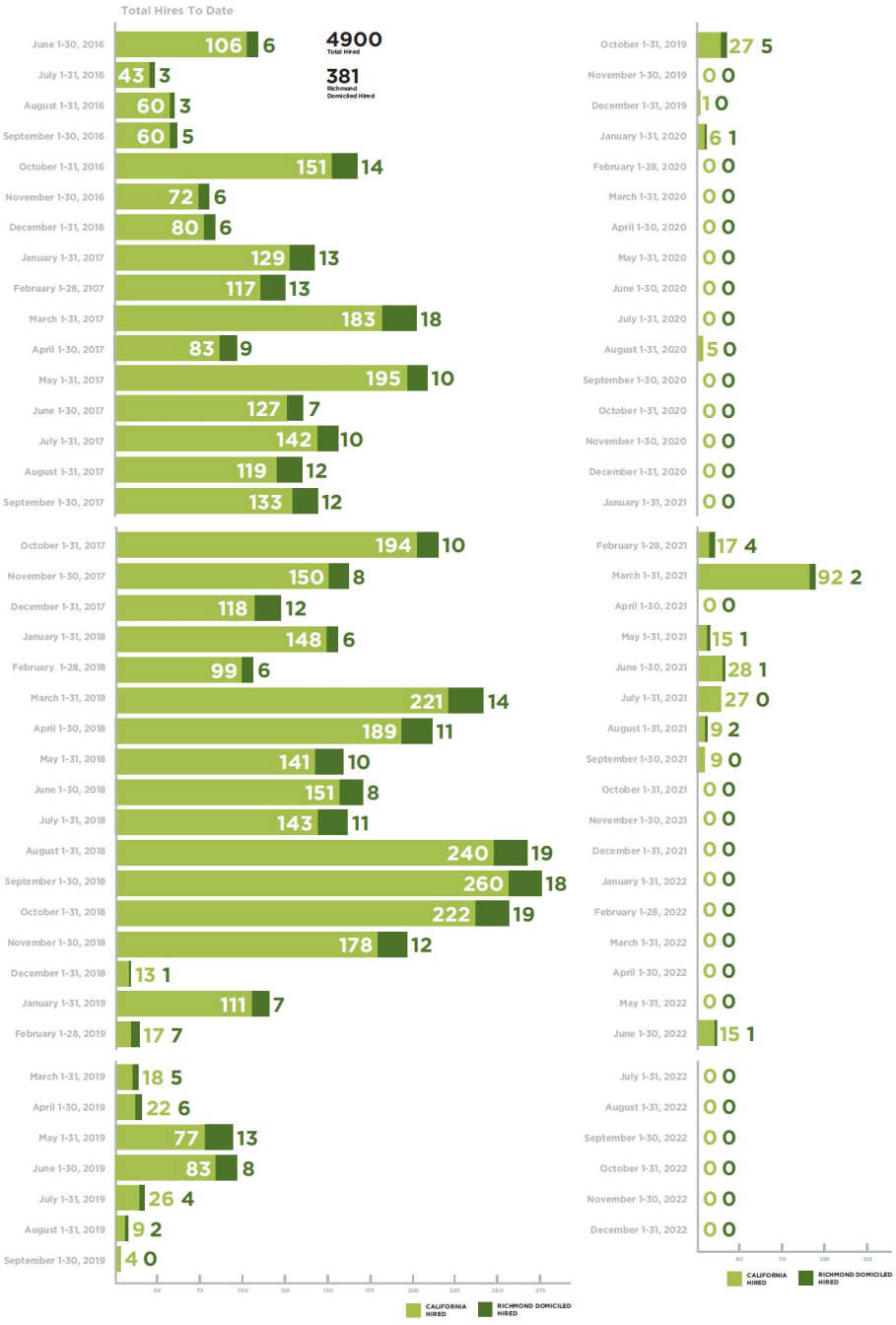


ATTACHMENT 9
Annual Operations Emissions Summary
Operational Year 2022

Pursuant to the City's approval of the Chevron Richmond Refinery ("Refinery") Modernization Project ("Project"), the Project is required to demonstrate compliance with commitments for no net increase (NNI) in emissions of criteria air pollutants (CAPs) and health risks from toxic air pollutants (TACs) compared with Refinery emissions for the 2008-2010 baseline period. Criteria air pollutants are defined as carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM_{10}), sulfur dioxide (SO_2), and volatile organic compounds (VOCs). A representative subset of TACs agreed upon by the City and the Refinery is used to assess compliance with the requirement for no net increase in health risks from TACs: benzene, diesel particulate matter (DPM), and naphthalene.

Pursuant to Condition B12 of the Project's conditional use permit (CUP), the Refinery must also demonstrate compliance with no physical increase (NPI) in greenhouse gas (GHG) emissions. The EIR calculates emissions of criteria air pollutants and toxic air contaminants for the Facility, which is comprised of emissions from the Refinery, Shipping, and Transportation. In the case of GHG emissions, indirect emissions from electricity and water usage are also calculated.

Chevron worked with the City and City's environmental consultant, Ramboll, to develop the Operations Emissions Tracking Tool (OETT), which calculates emissions of CAPs and TACs from the Refinery, as well as shipping and transportation activities, and compares those emissions to the Baseline established in the EIR. CAP, TAC, and GHG emissions for Shipping activities associated with the Richmond Long Wharf are calculated in the Shipping Module of the OETT, which was developed in consultation with the Shipping subject matter expert and approved by the City.

The OETT also calculates GHG emissions from shipping and transportation activities. GHG emissions from the Refinery are estimated and reported consistent with AB 32 as part of the mandatory monitoring and reporting program for the California Air Resources Board (CARB). Refinery GHG emissions are verified by a third party and subject to review by the CARB. Total combined GHG emissions from the Refinery, shipping, and transportation are then compared to the Baseline established in the EIR.

This document summarizes Chevron's compliance with the NNI commitment for CAP emissions and health risks from TAC emissions, as well as with the NPI commitment for GHG emissions for operational year 2022.

Operations Emissions Tracking Tool Methodology

The emissions reported in this document represent a direct comparison of Post-Project Emissions to the 2008-2010 Adjusted Baseline Emissions in the EIR using the same calculation methods. As described in Section 1.4.3 of the Draft EIR Appendix 4.3-OP, these calculations used a tiered approach for emissions data prioritized as follows:

- Continuous Emissions Monitoring System (CEMS) data
- BAAQMD Engineering Evaluation Emission Factors
- Updated BAAQMD Inventory Emission Factors
- Reported BAAQMD Inventory Emission Factors

All sources that were captured in the Adjusted Baseline Emissions inventory of the EIR were included in the emissions calculations reported in this document using the same calculation "tier", except for the sources that were shut down as a result of the Modernization Project. For sources that were modified as part of the Modernization Project and had new CEMS installed, the higher tiered data source was used as that represent a more accurate picture of actual emissions. Any sources added within the Refinery boundary since 2010 that

were not related to the Modernization Project were also included in this emissions report, using the appropriate calculation tier. Therefore, the emissions reported in this document are directly comparable to the EIR Adjusted Baseline Emissions and are used to evaluate compliance with the Refinery's commitment to No Net Increase in CAP emissions, no significant increase in health impacts from TAC emissions, and No Physical Increase in GHG emissions.

The Post-Project emissions forecasted and documented in the EIR were calculated using best available information at the time. This included predicting future refinery unit utilization and assuming that CAP, TAC, and GHG emissions would scale directly with unit utilization, as well as using BAAQMD-estimated emissions for new or modified units. Post-Project actual CEMs and meter data were of course not available at the time the EIR was written. Therefore, the post-Project emissions in the EIR were projected estimates, whereas the emissions reported in this document represent calculations based on directly-measured concentrations and flow rates, consistent with the EIR methodology for calculating the Adjusted Baseline Emissions.

Thus, the post-project emissions in this document include the use of actual reported fuel gas combustion to allow for changes in fuel gas usage per unit throughput, as well as continuously measured sulfur content. In contrast, the EIR methodology for calculating Post-Project emissions assumed a constant, direct relationship between throughput and fuel gas consumption, which is less accurate than the methodology used in this report but was necessary at the time due to the analysis being a prediction of future emissions without data inputs to rely on.

By calculating emissions directly based on the data inputs listed above, this report is thus consistent with the methodology utilized in the EIR to calculate Adjusted Baseline Emissions. Thus, these emissions provide the best comparable emissions for comparison with the Adjusted Baseline Emissions in the EIR for determination of the No Net Increase and No Physical Increase commitments.

Operations Emissions Summary

Facility operations emissions for 2022 include the entire calendar year of January 1 through December 31. The calculated total emissions demonstrate that the Refinery is in compliance with the NNI commitment for CAP and TAC emissions and with the NPI commitment for GHG emissions for Operational Year 2022. Upon request, emissions calculation tools and supporting documentation are available for review at the Refinery.

For TAC emissions, the total actual change, or delta, of toxic equivalents is compared with the maximum delta of toxic equivalents of scenarios modeled in the EIR. The maximum delta of toxic equivalents is based on the highest change in emission value for each of the three TACs. Those values are the highest emissions values modeled that show no significant health risk, which has the same meaning as no net increase in health risk for purposes of this mitigation measure. Therefore, a total actual delta of toxic equivalents results in no net increase in health risk if the total actual delta is less than the maximum delta of toxic equivalents.

As summarized in Tables 2022-CAP and 2022-TAC, Chevron complied with Modernization emissions limits for both CAPs and TACs.

Table 2022 - CAP 2022 Facility Cumulative CAP Emissions (in Tons)		
Criteria Air Pollutant (CAP)	**Actual Emissions[1,2]**	**Baseline Emissions**
Carbon Monoxide (CO)[3]	374	525
Nitrogen Oxides (NOx)[3]	984	1,303
Particulate Matter (PM_{10})	133	503
Sulfur Dioxide (SO_2)	261	373
Volatile Organic Compounds (VOCs)	826	973

[1] Based on data from January 1 through December 31.
[2] This data comes from the most recent Emissions Inventory pursuant to BAAQMD Rule 12-15 and could be subject to change based on additional BAAQMD comments.
[3] Actual Emissions use best available data consistent with Rule 12-15 reporting.

Table 2022 - TAC 2022 Facility Change in TAC Emissions (in Tons)		
Toxic Air Contaminant (TAC)	**Delta, Actual[1,2]**	**Delta, Maximum[3]**
Toxic Equivalents[4]	- 4.69	+ 1.68

[1] Based on data from January through December 31.
[2] This data comes from the most recent Emissions Inventory pursuant to BAAQMD Rule 12-15 and could be subject to change based on additional BAAQMD comments.
[3] Based on the Change in Emissions values in DEIR Tables A4.3-HRA-3, A4.3-HRA-5, and A4.3-SHP-3
[4] Toxic Equivalents are calculated as the sum of TAC emissions for benzene, naphthalene, and diesel particulate matter, weighted by their corresponding Inhalation Cancer Potency Factor from BAAQMD Regulation 2, Rule 5.

Table 2022-GHG shows Chevron's compliance with the Modernization NPI commitment with Baseline emissions[1].

Table 2022-GHG 2022 Facility GHG Emissions from Operations (in Metric Tons CO_2 equivalent (MT CO2e))		
Year	**Actual Emissions[1]**	**Baseline Emissions**
2022	4,069,557	4,602,947

[1] Based on data from January 1 through December 31.

[1] Facility GHG Baseline emissions are Baseline emissions from 2008-2010 period that are adjusted to take into account rulemaking changes and equipment upgrades and changes that were scheduled to take effect prior to 2016. These adjusted emissions are referred to in the EIR as Baseline (2016) and differ from the 2008-2010 baseline period.

CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
Mitigation Monitoring and Reporting Program, Section 4.3-8a
Annual Odor Report for Operational Year 2022

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

Pursuant to the Chevron Richmond Refinery Modernization Project (Project) Mitigation Monitoring and Reporting Program (MMRP) mitigation measure 4.3-8a, Chevron is submitting this annual compliance report to the City of Richmond (COR). Pursuant to mitigation measure 4.3-8a:

> "Chevron shall report annually to the City in writing on the number of odor complaints confirmed by the BAAQMD, and shall specify in such report, where applicable, whether each complaint relates to hydrogen sulfide, NH3, or an unspecified compound or source."

Per mitigation measures 4.3-8b and 8c, if in any year following commencement of Project operations there is an increase in the number of District-confirmed odor complaints above the baseline, and such odors are confirmed to have been related to ammonia and/or hydrogen sulfide, the mitigations contained therein are triggered.

As stated in EIR Volume 1, Part 4.3.4.4, "there were 62 confirmed odor complaints filed against Chevron with BAAQMD between January 1, 2008 and February 18, 2014, which is an average of 10.1 confirmed complaints per year."

The information reported herein pertaining to odor complaints are based solely on odor complaints that have been communicated via email from the District's Air Compliance Inspection Officer (APCO) to the Refinery's Environmental Field Coordinators (EFCs). Per District practice, emailed odor complaints alleging the Chevron Richmond Refinery as the source of odors typically contain at a minimum the complaint number, the date and time of the odor occurrence, the general location of the odor, a general description of the odor and the confirmation status of the odor and its source as determined by the APCO.

Odor Complaint Summary

All District-confirmed odor complaints received by Chevron during the 2022 operational year (January 1 through December 31), alleging the Richmond Refinery as the odor source are summarized in Table 1 below.

Table 1 – 2022 BAAQMD Confirmed Odor Complaints

Complaint Number	Date of Occurrence	Location of Odor	Odor Description
N/A	N/A	N/A	N/A

There were no District-confirmed odor complaint alleging the Chevron Richmond Refinery as the odor source during the 2022 operational year.

ATTACHMENT 11
Feedstock and Fuel Gas Monitoring Summary
Operational Year 2022

Pursuant to the Chevron Richmond Refinery ("Refinery") Modernization Project ("Project") Mitigation Monitoring and Reporting Program ("MMRP"), Chevron monitors its Facility feedstock and air emissions in accordance with MM 4.3-6c and MM 4.3-6d, which state, respectively, in relevant form:

> *"Chevron shall monitor designated metals in Facility feedstock and refinery fuel gas (RFG) and report annually on the correlation, if any, between total annual designated metal emissions (as calculated from RFG samples) and average annual concentrations of such metals in feedstocks. The annual report shall address the following metals of concern: nickel, vanadium, selenium, cadmium, and mercury. Metals are TACs, and contribute to health risks, and any net increase in metal emissions would also trigger the mitigation measure compliance requirements in Mitigation Measures 4.3-6a and 4.3-6b, above,*

and

> *Chevron shall monitor average annual sulfur and nitrogen concentrations in Facility feedstocks, and nitrogen-related refinery fuel gas air emissions, and report annually on the correlation, if any, between total annual nitrogen-related CAP and TAC emissions (as reported in the BAAQMD annual Emissions Inventory) and average annual concentrations of sulfur and nitrogen in feedstocks. Any such increase over Baseline would require compliance with mitigation measures specified above to ensure no net increase in CAPs or risks from TACs over Baseline levels"*

BACKGROUND

Extensive analysis for the EIR concluded that the Project's increase in sulfur removal capacity to process higher sulfur feedstocks could have potential to result in processing feedstocks with lower API, thereby increasing potential for increased metals and/or nitrogen content in feedstocks associated with lower API feedstocks; thus, there could be potential for an increase in metals emissions and/or nitrogen-related emissions due to Refinery operations required to process higher sulfur feedstocks. However, with respect to nitrogen-related emissions, Section 4.3.6.2.5 of the DEIR explicitly states that, "increased emissions of nitrogen compounds, including NOx and nitrogen-related TACs, are not anticipated as part of this Project, nor is any increase in risk from a nitrogen-related TAC." Based on agency and institution data, analysis for the EIR captured in EIR Appendix 4.3-MET showed:

- A "weak statistical relationship" between metals, specifically nickel and vanadium, and sulfur in feedstocks, and
- A "weak statistical relationship" between nitrogen and sulfur in feedstocks.

Limited data was available for cadmium and mercury.

METHODOLOGY

In accordance with MM 4.3-6c, Chevron measures and reports on metals in two different ways. First, the mitigation measure requires Chevron to monitor and review designated metals in facility feedstocks and fuel gas samples and report out on any correlation, where Facility feedstock is defined in the EIR Unit Rate Model (URM) as feedstocks to the crude unit and "gas oil gateway" process units[1]. Chevron has established a program to monitor and review designated metals in facility feedstocks and RFG samples. Total TAC emissions for refinery fuel gas combustion use metals sample data and Operations Emissions Tracking Tool (OETT) throughput rates sourced

[1] EIR Appendix 4.3-URM states that gas oil obtained from the crude until and gas oil purchased by and shipped to the Facility is processed at one of five gas oil gateway units: the fluidized catalytic cracker feed hydrotreater (FCC FHT), the fluid catalytic cracker (FCC); the hydrocracker; and the light neutral hydrocracker (LNC) and heavy neutral hydrocracker (HNC).

from the Refinery's annual Emissions Inventory, also referred to as BAAQMD Rule 12-15 Emissions Inventory (EI). Second, MM 4.3-6c requires Chevron to verify designated metals emissions specified as part of this mitigation measure have resulted in no net increase to health risk compared with Baseline levels.

Chevron complies with MM 4.3-6d in two different ways: first, by implementing a program to monitor and report annually on the correlation, if any, between total annual nitrogen-related CAP and TAC emissions and average annual concentrations of sulfur and nitrogen in feedstocks; and second, by assessing no net increase in nitrogen-related CAPs or risks from nitrogen-related TACs over Baseline levels, as measured and reported in the OETT.

Refinery CAP emissions are calculated in the Annual Operations Emissions Summary and use the calculation methodology referenced therein. See Attachment 9: Annual Operations Emissions Summary. For purposes of assessing no net increase in health risk from TAC emissions, the total actual change, or delta, of each pollutant is compared with the maximum delta of each pollutant from scenarios modeled in the EIR and included in DEIR Table A4.3-HRA-3, with the exception of vanadium[2]. This assessment is based on the Health Risk Assessment (HRA) in the Project EIR, which evaluated potential health effects from toxic air contaminants (TACs) by operation associated with the Project. EIR Table A4.3-HRA-2 lists the Facility TAC emissions, which include the following metals associated with refinery fuel gas combustion[3]: nickel (Ni), vanadium (Vn), selenium (Se), cadmium (Cd), and mercury (Hg).

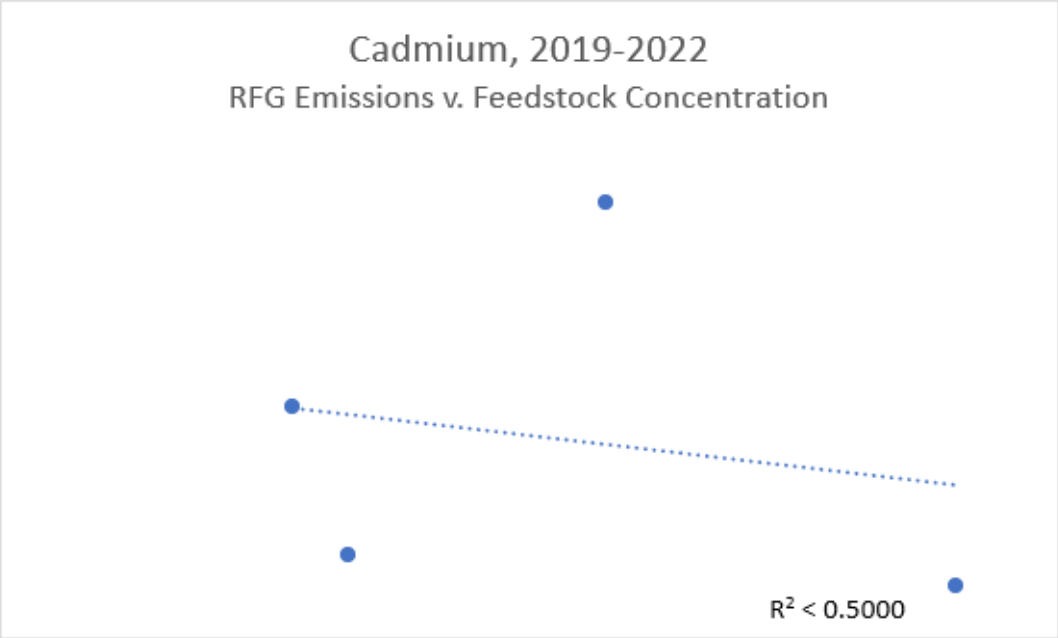
Assessing no net increase in health risk from TAC emissions uses a similar approach as is used for benzene, diesel particulate matter, and naphthalene in the OETT. The maximum delta is based on the highest change in emission value for each TAC. Those values are the highest emissions values modeled that show no significant health risk, which has the same meaning as no net increase in health risk for purposes of these mitigation measures. Therefore, a total actual delta results in no net increase in health risk if the actual delta is less than the maximum delta.

RESULTS

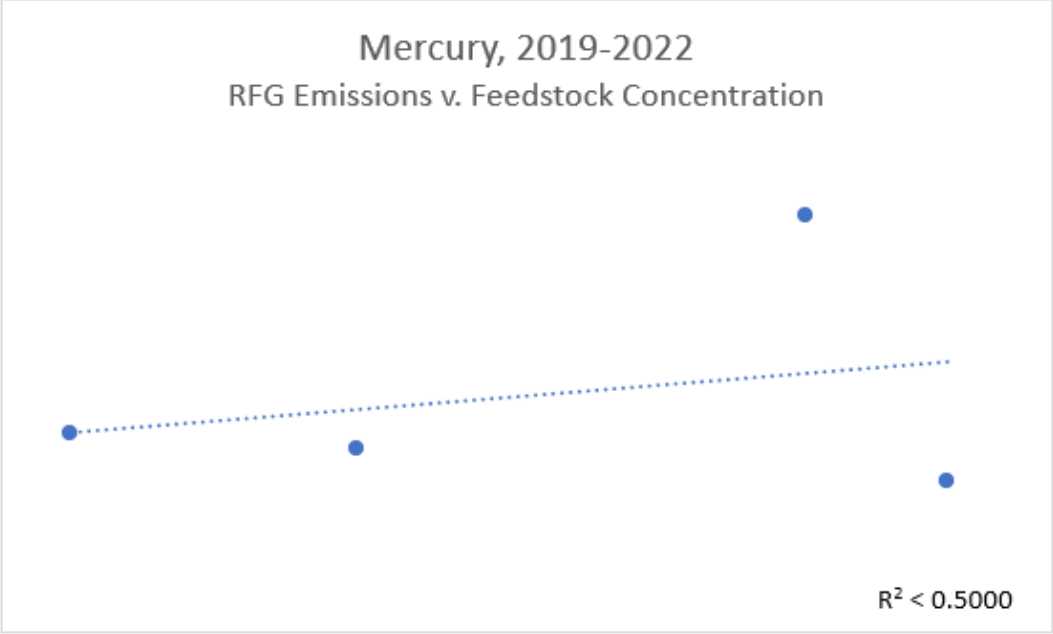
For purposes of assessing if the correlations contemplated by MM 4.3-6c and MM 4.3-6d exist, Chevron has implemented the program described above and collected data for a minimum of three years in order to assess if a correlation exists. Annual pollutant values for the past three years are displayed below in Graphs 11.1 through 11.6. There is no correlation between feedstock concentration and metals emissions which is further underscored by the low R squared value associated with these datasets. Each annual pollutant value corresponds to the total emissions associated with fuel gas combustion for that pollutant, shown on the y-axis, as a function of the annual average feedstock concentration of that pollutant, shown on the x-axis. The underlying data for the annual pollutant value is confidential business information, and, as such, is maintained at the Refinery.

[2] DEIR Tables A4.3-HRA-2 and 3, which detail total TAC emissions from all sources and TAC emissions from refinery operations, respectively, show that vanadium was not included in the EIR for refinery operations sources, consistent with the BAAQMD Emissions Inventory and Engineering Evaluation. All Vanadium emissions in the EIR are from shipping. In addition, vanadium was not included in the HRA, as shown in these tables. Thus any "increase" in Vanadium emissions in RFG would not result in an increase in health risks per EIR methods. The total actual vanadium emissions from fuel gas combustion were calculated and found to be below the BAAQMD 2-5 trigger level.

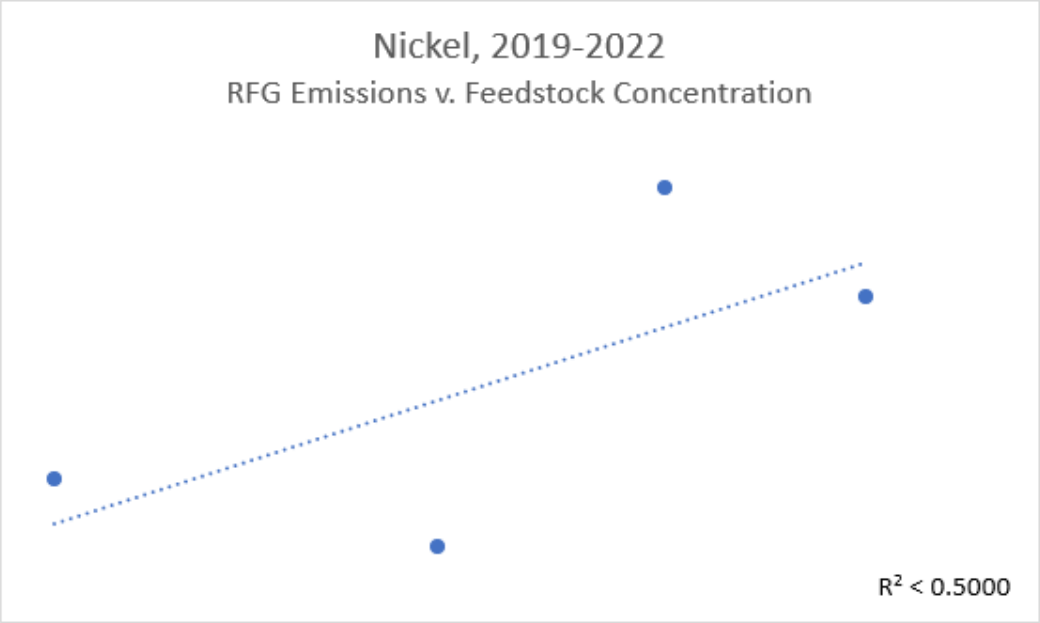
[3] DEIR Table A4.3-OP-4 lists the RFG combustion TACs; this list contains the previously stated five metals but no nitrogen-related TACs and, therefore, only nitrogen-related CAP emissions from RFG combustion apply for MM 4.3-6d.



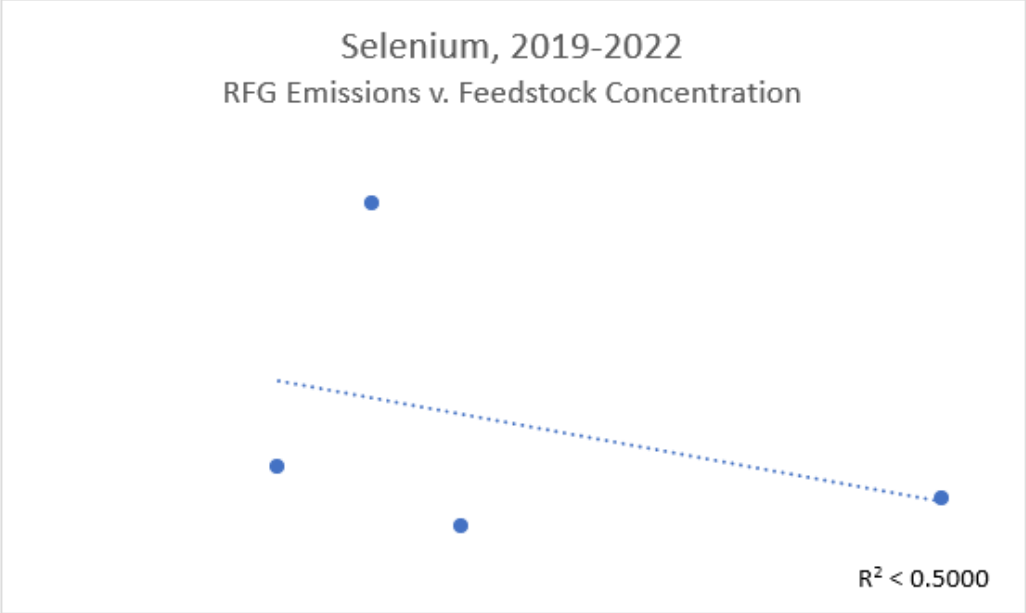
Graph 11.1. Cadmium, emissions displayed as a function of feed concentration.



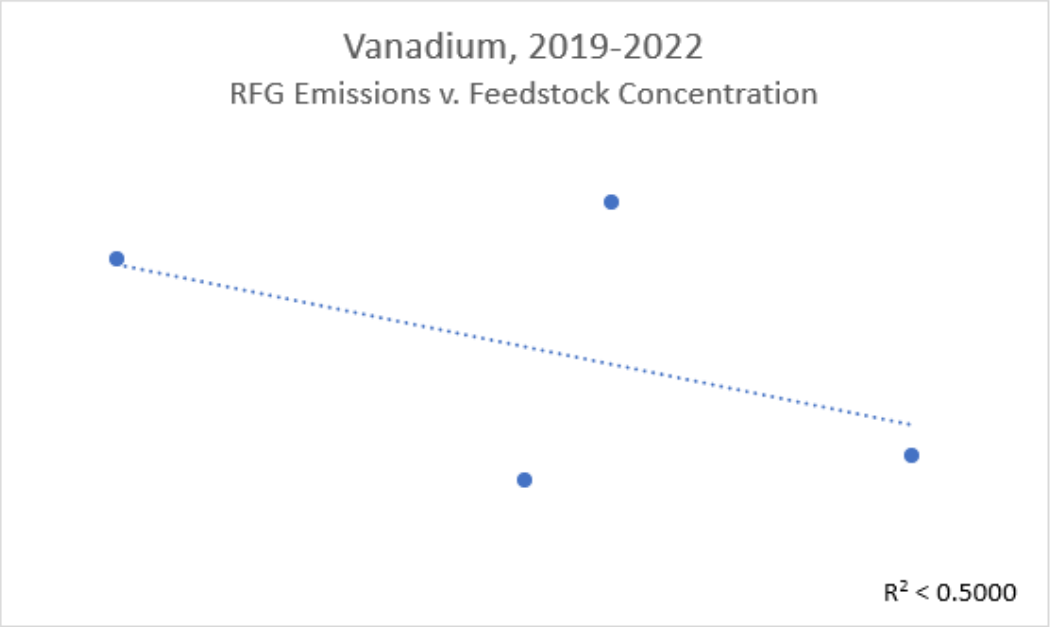
Graph 11.2. Mercury, emissions displayed as a function of feed concentration.



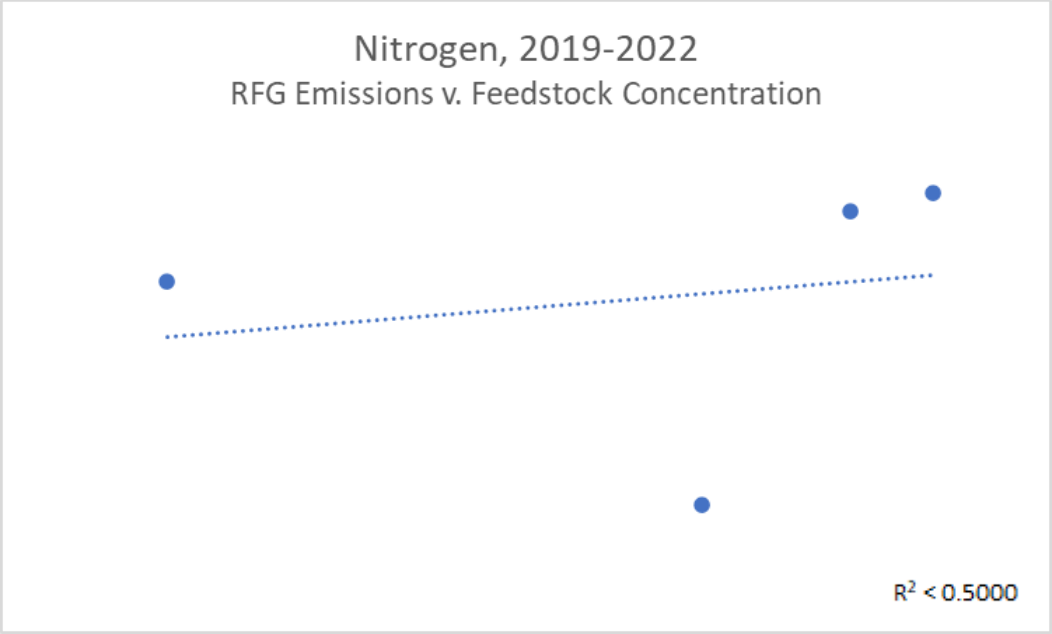
Graph 11.3. Nickel, emissions displayed as a function of feed concentration.



Graph 11.4. Selenium, emissions displayed as a function of feed concentration.



Graph 11.5. Vanadium, emissions displayed as a function of feed concentration.



Graph 11.6. Nitrogen, NOx emissions displayed as a function of feed concentration.

For purposes of determining if Chevron has met the no net increase commitments described above, Chevron has calculated respective CAP and TAC emissions required by MM 4.3-6c and MM 4.3-6d. As shown in the following tables, there has been no net increase in nitrogen-related CAP emissions and no net increase in health risk from refinery fuel gas metals and nitrogen-related TAC emissions. For CAP emissions, the total nitrogen-related emissions are below baseline levels. See Attachment 9: Annual Operations Emissions Summary. For TAC emissions, the total actual change, or delta, of each TAC pollutant is less than the maximum delta of each TAC pollutant from scenarios modeled in the EIR; therefore, mitigation was not triggered. See Table 2022-MM 4.3-6c and Table 2022-MM 4.3-6d below.

Table 2022-MM 4.3-6c 2022 Change in Metals Emissions (in lb)		
Pollutant	**Delta, Actual[1,2]**	**Delta, Maximum[3]**
Nickel	-3.0	+ 80.8
Vanadium	See Footnote 2	See Footnote 2
Selenium	-0.8	+ 81.5
Cadmium	+0.6	+ 9.8
Mercury	-1.5	+ 3.9

[1] Based on data from January 1 through December 31.
[2] This data comes from the most recent Emissions Inventory pursuant to BAAQMD Rule 12-15 and could be subject to change based on additional BAAQMD comments.
[3] Uses the Change in Emissions values from Table A4.3-HRA-2

Table 2022-MM 4.3-6d 2022 Refinery Nitrogen-Related CAP Emissions (in Tons)		
Pollutant	**Actual Emissions[1]**	**Baseline Emissions**
Nitrogen Oxides (NOx)[2]	See Attachment 9	

[1] Based on data from January 1 through December 31.
[2] Actual Emissions use CEMS data.

ATTACHMENT 12
Project Operations Compliance Plan

CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
CONDITIONAL USE PERMIT OPERATIONS COMPLIANCE PLAN

August 30, 2018 (rev. 2 4/18/19)

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

INTRODUCTION

On July 29, 2014, the City of Richmond approved Conditional Use Permit and Design Review Permit No. PLN11-089 ("CUP") for the Chevron Refinery Modernization Project ("Project"). Pursuant to CUP condition A9:

> "Within six (6) months after approval of this Conditional Use Permit or prior to issuance of the first grading, fire construction, or building permit for the Modernization Project, whichever is earlier, Chevron shall submit a written plan describing how it will meet the requirements of each Condition of Approval. An independent auditor or other third-party expert selected by the City shall review the plan and shall advise the Planning and Building Services Department on whether or not Chevron's plan is reasonably likely to achieve compliance with each Condition of Approval. If the City is not satisfied with the compliance plan submitted by Chevron, Chevron shall cooperate in good faith with the City and its experts to modify the plan to satisfy the City. Chevron shall reimburse the City for any and all costs and expenses associated with the review of the plan and the auditor or third party's review and advice to the City regarding Chevron's written plan."

The Conditions, Mitigation Measures, and Reliability Program components (collectively "CUP/MMRP") can generally be divided into three categories: pre-construction, construction, and operations. Chevron submitted its pre-construction Compliance Plan on June 16, 2016 and provided an update to that plan on October 7, 2016. For status with the construction related components, please refer to the Annual Compliance Report submitted to the City of Richmond on March 31, 2018. This submittal serves as the Project's Operations Compliance Plan and documents Chevron's systems for compliance with each operations-related Condition of Approval, Mitigation Measure, and Reliability Program Component. Each condition of approval, mitigation measure, or Reliability Program requirement is identified next to the component of the compliance system pursuant to which implementation will be facilitated and tracked.

COMPLIANCE VERIFICATION - OPERATIONS[1]

Compliance verification for the operations requirements will be managed by the **Refinery** and are described in this section, including structure and governance. The Refinery is divided into the following organizational divisions:

- Operations
- Maintenance and Reliability
- **Health, Environmental, and Safety (HES)**
- **Process Safety Management (PSM)**

[1] Terms which initially appear in bold are defined in the attached Glossary.

- Technical
- Strategic and Facilities Planning

In addition, the Refinery is supported by onsite corporate services including Human Resources, Procurement, Finance, Control and Information Systems, and Capital Projects.

The overall framework for compliance with the CUP/MMRP is the **Modernization CUP Compliance System,** which is intended to establish the compliance structure utilized to meet the requirements of the CUP/MMRP, and specifically the new operational limits associated with the no net increase (NNI) in **CAP** emissions, NNI in health risks from **TACs**, and no physical increase (NPI) in **GHG** emissions. All ongoing and future Project commitments associated with Refinery operations have been incorporated into the Refinery's compliance structure. This structure consists of the following elements:

- Programs of Compliance
- Tools and Applications
- Guidance Documents
- Written Plans

TrainingThe Refinery utilizes these elements to maintain compliance where multiple organizations within the Refinery have roles and responsibilities. This system will reside on the Refinery's intranet webpage and is accessible to all Refinery personnel.

As Project components become operational, responsibility for compliance with CUP/MMRP requirements is turned over from the **Modernization Compliance Team** to the Refinery. The Refinery's **HES** and **PSM** organizations are staffed to provide monitoring, tracking and reporting of compliance with regulatory requirements and commitments using sustainable programs and systems. These organizations are supported by additional Refinery personnel, including Operations, Maintenance and Reliability, Planning, and Technical, as applicable.

A. PROGRAMS OF COMPLIANCE

The following new and existing programs will be utilized to implement the CUP/MMRP requirements:

1. **Crude Monitoring Program** [MM 4.3-6c, 6d, 4.13-7i, 4.13-7j; Reliability Program III.C1, C6, D1, E2, E3, H1, I2; IV.A]

   Chevron has developed and implemented a Crude Monitoring Program that captures post-Project requirements for monitoring crude, including sulfur, TAN, mercaptans, metals, nitrogen, etc. This program establishes the processes needed to implement Reliability Program requirements, including additional reliability analysis and reporting. Specifically, the program outlines the roles and responsibilities for action owners responsible for monitoring the sulfur triggers in crude blends, which when reached, will require additional inspection and analysis needed to fulfill the requirements of the Reliability Program. In addition, the program specifies how monitoring of other components of crude, like TAN and mercaptans, will be achieved to meet reliability

reviews, reporting, and recordkeeping requirements. The following requirements are specifically incorporated in the program.

a. Metals in feedstock and RFG [MM 4.3-6c]

b. Annual sulfur and nitrogen concentrations in feedstocks and RFG [MM 4.3-6d]

c. TAN [MM 4.13-7i]

d. Post-operations Sulfur triggers [III.C1, C6, D1, E2, E3, H1, I2; IV.A]

2. **Title V Permit Compliance System** [PC 24136; CUP B3, B4, B5, B6, D1, D2; MM 4.3-6a2]

Modernization **Authority to Construct (ATC)** Permit Condition 24136 and other associated compliance requirements that specify operational limits are incorporated into the Refinery's Title V Air Permit and its compliance system. The refinery also monitors uses these Title V compliance systems to monitor Project utilization rates.This system includes the following elements, which are each managed by Refinery HES staff, and supported by Refinery personnel, including Operations and Maintenance, as applicable.

- **Critical Environmental Variables (CEVs)**
- **Continuous Emissions Monitoring System (CEMS)** and **Parametric Monitoring System (PMS)**
- Source Testing
- **Leak Detection and Repair Program (LDAR)**
- Commissioning Plan
- Routine Duties
- **Flare Minimization Plan**
- Title V Compliance reporting database

3. **Fixed Equipment Asset Strategies** [CUP G1, G5; Reliability Program II.2, II.3, III.C7, D3, E1, E4, E7, H, I3, I4, IV.B.; MM 4.13-13h]

Chevron's Fixed Equipment Asset Strategy (FEAS) program is designed to prevent and mitigate losses of containment in **fixed equipment** by developing inspection strategies specific to the equipment and the service. Manufacturing Standard 525, or MFG 525, Fixed Equipment Asset Strategies Standard describes the process the Refinery utilizes to create and maintain these strategies. Elements of the program include:

- **Damage Mechanism Reviews (DMR)**

  A Chevron work process that requires a multidiscipline team to:
  - Identify damage mechanisms for piping and equipment.
  - Evaluate existing safeguards and mitigations for the applicable damage mechanisms.
  - Develop recommendations for improving safeguards and mitigations.
- **Integrity Operating Windows (IOWs)**

Established limits for process variables (parameters) that can affect the integrity of the equipment if the process operation deviates from the established limits for a predetermined length of time (per API RP 584) and provides notifications when such deviations occur. Includes Critical, Standard, and Informational IOWs.

- **Circuit Analysis**

  A Chevron work process that requires a multidiscipline team to determine:

  - Total potential condition monitoring locations (CMLs) for each applicable damage mechanism and the percentage of total potential CMLs to select for inspection,
  - Initial (if required) and subsequent inspection intervals of selected CMLs,
  - Additional CMLs that require monitoring due to high corrosion rates or low remaining life or to comply with jurisdictional requirements, Chevron best practices, or other documentation on inspection requirements.

- **Condition Monitoring Locations (CMLs)**

  Designated areas on assets where periodic examinations are conducted; also known as thickness monitoring locations (TMLs).

- **Inspection, Testing, and Preventative Maintenance (ITPM)**

  A documented component of an asset strategy that consists of the complete list of surveillance, predictive maintenance and non-intrusive tasks that help ensure risk mitigation to the approved level for the asset. Tasks are listed with description, interval, responsible personnel, and references to acceptance criteria.

4. **Richmond Industrial Safety Ordinance (RISO) Compliance Systems** [MM 4.13-7a, 13c; II, IV.F.2,]
   Chevron leverages compliance systems for RISO where overlap exists between the mitigation measures and the RISO. RISO compliance mechanisms ensure sustainability and consistency with the mitigation measures.

B. TOOLS AND APPLICATIONS

New and existing tools and database applications have been created or modified to meet compliance with the CUP/MMRP. These tools are being utilized to calculate emissions, schedule and verify task completion, and manage existing Refinery databases to perform work. These tools include:

1. **<u>Operations Emission Tracking Tool (OETT)</u>** [MM 4.3-5, 6a, 6b; MM 4.8; CUP B12]

   Chevron worked with Ramboll, the City's environmental consultant, to develop an operations emissions tracking tool (OETT), which when finalized will provide the method pursuant to which Chevron will report on its compliance with its commitment to no net increase in CAP emissions, no net increase in health risks from TACs, and no physical increase in GHG emissions. An OETT guidance document has been created to ensure consistency in the use of the tool and identifies the responsible parties and action items needed to perform periodic emissions calculations throughout the calendar year. An Environmental Specialist within the HES organization will monitor emissions data

and inform Planning of the results to facilitate operational compliance. The OETT will enable Chevron to report project emissions to the City on an annual basis.

2. **Essential Suite Compliance Module** [All future and ongoing requirements, including CUP B1, B11; MM 4.8-2; ECIA 2.B, IV.D]
   Compliance tasks have been created and uploaded into the Refinery's Essential Suite Compliance Module which assigns tasks to appropriate Refinery personnel to manage compliance with ongoing and future requirements, including periodic reports, monitoring, and inspections. This program tracks completion of assigned periodic tasks (eg. monthly, quarterly, yearly) and provides accountability through a management reporting structure. The Essential Suite Compliance Module is managed by HES staff, and supported by Refinery personnel, including Operations and Maintenance, as applicable. All assigned tasks in Essential Suite are monitored using OERI (see number 7 below) which is a dashboard tool viewable to Refinery personnel. On an approximately monthly basis, refinery management reviews tasks for completion.

3. **Scheduling Databases** [CUP G1, III.C7, E1, E4, I3, I4]
   The Refinery utilizes IMPACT Web database to manage work needed to be completed during scheduled turnaround events. A routine work order database is used to manage routine maintenance work performed when the process facility is online. Another database is used to schedule and document ultrasound and X-ray inspections. Follow-up inspections required by the Reliability Program have been incorporated into these databases, as appropriate, to manage and schedule the completion of these inspections.

4. **Process Monitoring and Optimization Tool (PMO)** [CUP G1, III.C.8, III.D3, E7, F]
   Chevron uses Process Monitoring and Optimization Tool (PMO) for each process unit to monitor process conditions to provide data concerning optimization, as well as reliability and environmental conditions. This data is also considered as part of the Unit Reliability Brief (URB) meetings which are attended by **Area Business Unit** management and subject matter experts in the areas of reliability and operations to review reliability topics relative to current operation.

5. **Permasense® Monitors** [III.B, C2, E5]
   Chevron has installed and upgraded 118 Permasense® monitors in the Crude Unit and is planning for the installation of 25 monitors in the Solvent Deasphalting (SDA) Unit, scheduled for 2Q2019. Permasense® is continuous monitoring ultrasonic thickness gauge monitors that are utilized by the Refinery to monitor pipe thickness. Chevron has also developed an asset strategy to ensure the long-term maintenance of this equipment.

6. **Crude Acceptance Tool** [MM 4.13-7i; III.C10]
   The Refinery utilizes a Crude Acceptance Tool in evaluating new crudes and crude blends. This tool assists Planning in determining if crude blends and resulting products are within specifications for the downstream processing units. Chevron has incorporated its TAN limits and mercaptan flags into this tool in order to fulfill its obligations for reliability review and reporting.

7. **OERI** [Future and ongoing requirements]

OERI is a reporting tool that tracks various metrics, including safety, operations, and reliability metrics, by automatically pulling data from the Refinery's information management systems. The Refinery uses OERI to track completion of its compliance obligations.

C. GUIDANCE DOCUMENTS

Guidance documents have been created to document the technical basis of how the Refinery will comply with specific requirements. These documents are utilized by subject matter experts (SME) to meet compliance requirements and ensure long-term sustainability of the compliance programs built to meet the CUP/MMRP obligations. They reference the roles and responsibilities for key personnel to maintain compliance. Guidance documents developed for the Project include:

1. **Annual Compliance Report Guidance Document** [CUP G2, H5]

   A guidance document for the preparation of the Annual Compliance Report was developed to summarize all elements of the report and associated requirements. The document covers the items to include in the report necessary for the City of Richmond to prepare for the annual presentation to the Planning Commission.

2. **Annual Reliability Program Report Guidance Document** [MM 4.13-7a, 7c, 7i, 7j, 13f, 13h; IV.H]

   A guidance document for preparation of the Annual Reliability Program Report was developed to summarize all elements of the report and associated requirements that its intended to cover. The document references roles and responsibilities for each of the reporting requirements so that the report facilitator within the Refinery's HES or PSM organization can organize submittal of this report.

3. **OETT Guidance Document** [MM 4.3-5, 6a, 6b; MM 4.8; CUP B12]

   A guidance document for maintaining the OETT is being developed and will ultimately encompass the final OETT functionality to assure consistent and timely updates in order to track Facility emissions and compliance with the NNI and NPI commitments. This document lays out each step necessary to update the tool on a routine basis and the origin of each data set. The document also summarizes quality checks and reporting obligations.

4. **IOW Reporting Guidance Document** [4.13-13h]

   A guidance document was developed for reporting IOW level one alerts within one week of the alert and IOW2 alerts if process temperature exceeds the established temperature for a cumulative 365 days. The document provides a template for reporting within one week, methods for obtaining the data to include in the report, and for quality assuring the data.

5. **RI-434 Agency & Internal Communications, Notifications, and Reporting** [CUP E1; MM 4.13-5c, 4.3-8a, 8b, 8c, 8d, 8e]

Refinery Instruction 434, RI-434, Agency & Internal Communications, Notifications, and Reporting has been updated to include reporting of spills and releases, flaring events, and odor complaints.

a. Spill and release [MM 4.13-5c]

Chevron reports all spills and releases of hazardous materials or hazardous waste to the environment, including those from the transportation of those materials, within 48 hours to the City, and to the other appropriate regulatory agencies in accordance with the timing and other notification and reporting requirements prescribed by the applicable laws and regulations. Chevron updated its existing RI-434 to include reporting of this existing notification requirement to the City of Richmond.

b. Flaring [CUP B1]

Notifications required under BAAQMD Regulation 12 Rule 12-405 are also made to the Richmond Police and Fire dispatch and a phone call with this information is also placed to the Richmond Planning Division Senior Planner. Chevron updated its existing RI-434 to include reporting of this existing notification requirement to the City of Richmond.

c. Odor complaints [MM 4.3-8a, 8b, 8c, 8d, 8e]

The Refinery's Odor Management Team manages tracking and resolution of all odor complaints. Chevron has implemented RI-434 which details the communication process for investigating and reporting outside odor complaints. This process has been modified to track, when confirmed, complaints related to hydrogen sulfide, ammonia, or an unspecified compound or source. RI-434 details the roles and responsibilities for response and reporting of odor complaints.

6. RI-506 Refinery Hazardous Waste Management [MM 4.13-4e]

The Refinery utilizes Refinery Instruction 506, RI-506, Refinery Hazardous Waste Management for management and disposition of spent catalyst which includes compliance with re-use and recycle requirements. Chevron will comply with recordkeeping and reporting requirements as specified.

7. List of Referenced Reliability Program Documents [IV.E]

The Refinery has developed a list of all referenced programs, procedures, and refinery documents used and maintained for compliance with requirements of the Reliability Program. This list is maintained by the Refinery's HES organization, and will transition to the PSM organization over longer term operation of Modernization.

8. California State Lands Commission (CSLC) Reports [MM 4.13-5a]

Mitigations from the Long Wharf EIR are provided in reports to the CSLC pursuant to Chevron's 2009 lease with CSLC. Copies of the reports are available from CSLC or Chevron.

D. WRITTEN PLANS [MM 4.9-7, 4.13-4c, 4d]

1. **Flood Contingency Plan**

Within five years of construction completion, Chevron will retain qualified professionals to develop a Facility flood contingency plan that addresses all types of coastal flooding (i.e., storm-related flooding, extreme high tides, and tsunamis) and how these coastal flooding hazards will increase over time due to sea level rise. The contingency plan will be submitted to the City of Richmond for review and approval.

2. Hazardous Materials Business Plan

Chevron submitted written confirmation of CCHS's acceptance of Chevron's hazardous materials business plan that incorporates the new hydrogen plant to the City of Richmond Building Department on April 3, 2019.

3. Spill Prevention, Control, and Countermeasures Plan (SPCC)

Chevron has completed a revision to its SPCC Plan prior to the regulatory deadline and will continue to revise the Plan in the future as required by 40 CFR Part 112.

4. Emergency Response Plan (ERP)

The Facility Emergency Response Plans have been updated and will continue to be updated as required. In addition, a pre-incident scenario addressing the new Hydrogen Plant emergency response neeeds has been prepared and reviewed in detail within the Refinery. CCHS verified implementation of the ERP in August 2018.

E. TRAINING

Training on the above elements of the Program has been developed and conducted for key personnel including HES, PSM, Refinery Leadership Team, Operations, Maintenance and Reliability, Technical, and general Refinery personnel. The training elements include:

1. **Computer Based Training (CBT)** [all future and ongoing requirements]

   Computer Based Training of the Program has been developed for initial and periodic refresher training of the key elements of ongoing requirements associated with the CUP and MMRP.

2. **Face-to-face Training** [all future and ongoing requirements]

   Onboarding face-to-face training is in development for key personnel responsible for oversight and implementation of compliance requirements.

3. **Other Training**

   a. Fitness for Service Training [applicable Reliability Program components]

   b. Emergency Response Training for emergency responders has been developed and implemented on an annual basis. [MM 4.13-7f, 11b, 11c; 4.14-2]

   c. Training of operators in Emergency Operating Procedures has been completed prior to the commencement of Modernization Project operations and will continue on a routine basis through the **Operator Training Program**. [MM 4.13-11b]

GLOSSARY

A glossary of acronyms and other terms used throughout the Appendices has been provided.

GLOSSARY

ABUM or Area Business Unit Manager is a job title within Richmond Refinery line operations. Area Business Unit Manager duties can include ownership and management of business initiatives within a Business Unit or Division.

API or American Petroleum Institute is a trade association for the oil and gas industry. API develops a number of technical standards for the oil and gas industry to enhance safety and assure quality.

API 570 is the API Recommended Practice for piping inspection code.

API 571 is the API Recommended Practice for damage mechanisms affecting fixed equipment in the refining industry.

API 578 is the API Recommended Practice providing guidance and standards to the oil industry for positive materials identification.

API 584 is the API Recommended Practice providing guidance and standards to the oil industry for Integrity Operating Windows.

ATC or Authority to Construct is an air permit issued by the **BAAQMD** authorizing the Facility to construct and operate a permitted project. The ATC outlines emission limits and standards, monitoring, reporting, and recordkeeping compliance requirements for the permitted equipment and emission sources.

BAAQMD is the Bay Area Air Quality Management District and is the agency which oversees the Title V Permit program.

CalARP is the California Accidental Release Prevention Program.

CalOSHA is the California Occupational Safety and Health Administration.

CAP is Criteria Air Pollutants which include nitrogen oxides (NOx), carbon monoxide (CO), sulfur dioxides (SO2), particulate matter (PM).

CARB is California Air Resources Board.

CCHS is Contra Costa County Health Services

CEMS or Continuous Emission Monitoring System is the total equipment necessary for the determination of a gas or particulate matter concentration or emission rate using pollutant analyzer measurements and a conversion equation, graph, or computer program to produce results in units of the applicable emission limitation or standard. [Source: https://www.epa.gov/emc/performance-specifications-and-other-monitoring-information]

CEVs or Critical Environmental Variables are environmental-related process monitoring conditions, including emissions as monitored through a CEMS, that inform Operations to maintain compliance with Title V requirements.

CFR is the Code of Federal Regulations.

Circuit is a section of piping that is exposed to a process environment of similar corrosivity or expected damage mechanisms and is of similar design conditions and construction material (per API 570). Other pressure equipment types can be broken into multiple circuits depending on potential corrosion mechanisms.

CSLC is the California State Lands Commission.

Compliance Assurance is a Chevron OE process by which compliance with all internal and external regulatory practices can be measured and assured.

CBT is Computer Based Training**.**

CMLs or Condition Monitoring Locations are designated areas on assets where periodic examinations are conducted.

Crude Acceptance Tool is a tool utilized to ensure all process, reliability, and compliance constraints are considered when evaluating a new crude.

Damage Mechanism is any type of deterioration encountered that can result in flaws or defects that can affect the integrity of an asset, i.e. corrosion, cracking, erosion, dents, and other mechanical, physical, or chemical impacts. See **API 571** for a comprehensive list and description of damage mechanisms.

DMR or Damage Mechanism Reviews is a Chevron work process performed by a multidiscipline team to identify damage mechanisms for piping and equipment, evaluate existing safeguards and mitigations for the applicable damage mechanisms, and develop recommendations for improving them.

DTSC is the California Department of Toxic Substances Control which governs hazardous waste laws.

EPA or US EPA is the United States Environmental Protection Agency.

ERP is Emergency Response Plan

Essential Suite® Compliance Module is the Chevron enterprise standard tool selected for Compliance Assurance. Essential Suite® is provided by IHS, Inc., based in Englewood, Colorado. IHS provides business software for management of Health, Environment, and Safety requirements [subsidiaries include Carfax and Jane's Information Group].

Chevron also uses Essential Suite® Waste and Air modules at an enterprise level for waste management and air emissions reporting, respectively.

Essential Suite® Compliance Module features-

- Manages regulatory register of requirements, controls, and tasks.
- Tracks assigned owners of requirements
- Provide e-mail notifications of tasks due and status
- Enables report generation and verification
- Enables auditing of compliance assurance performance
- Integration with CyberRegs® web-based regulatory database maintains updated regulatory references

Facility as used in the Modernization Project Final Environmental Impact Report refers to the Refinery and associated transportation sources (e.g., Long Wharf).

Fixed equipment includes pressure vessels, boilers, on-plot and off-plot piping (including valves), atmospheric storage tanks, and furnaces within Chevron-operated refineries.

Fixed Equipment Asset Strategy or FEAS is Chevron's plan for the inspection, testing, preventative maintenance, routine duties, and other tasks that are required to maintain the function of fixed equipment. This strategy is defined in Manufacturing Standard, MFG 525.

Flare Minimization Plan is a BAAQMD-regulated plan which details how the Facility will plan and execute, including minimizing, its flaring activities, planned and unplanned.

GHG is Greenhouse Gases which refer to gases that trap heat in the atmosphere including carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and fluorinated gases.

Guidance document is a written document used to explain internal practices.

HES organization refers to the Refinery personnel responsible for the development and implementation of compliance programs to meet HES requirements including EPA, CARB, CLSC, BAAQMD, DTSC, and **RWQCB** regulations.

ITPM or Inspection, Testing, and Preventative Maintenance is a documented component of an asset strategy that consists of the complete list of surveillance, predictive maintenance, and non-intrusive tasks that help ensure risk mitigation to the approved level of the asset. Tasks are listed with description, interval, responsible personnel, and references to the acceptance criteria.

IOWs or Integrity Operating Windows establishes limits for process variables (parameters) that can affect the integrity of the equipment if the process operation deviates from the established limits for a predetermined length of time (per **API 584**). Includes critical, standard, and informational IOWs.

ISS or Inherently Safer Systems refers to systems used in process industries which seek to reduce or eliminate hazards over controlling them.

LDAR or Leak Detection and Repair is a program regulated by EPA for monitoring and repairing equipment components that may emit air contaminants. Components may include pumps, pipe connectors, flanges, valves, drains, and pressure-relief devices (PRD).

LOPA or Layer of Protection Analysis is a methodology for hazard evaluation and risk assessment.

Maximo is a tool utilized by the Refinery to schedule and track completion of routine maintenance activities and tasks.

MFG or Manufacturing Standard refers to internal Chevron instructions for compliance with rules, regulations, practices, or instructions affecting more than one facility or refinery. Manufacturing Standards are issued and maintained by Chevron Global Manufacturing.

MOC or Management of Change is a PSM process which details how the Facility will manage changes to its processes or organization. The Refinery utilizes Refinery Instruction (RI) 370 to manage its MOC program.

Modernization Compliance Team is a team of subject matter experts in HES, PSM, and Compliance Assurance put in place during the Richmond Modernization Project construction and commissioning to provide support for Chevron's compliance with the Modernization Conditional Use Permit.

Modernization CUP Compliance System establishes the compliance structure that will be utilized to meet the requirements of the CUP/MMRP, and specifically the new operational limits associated with the no net increase in CAP emissions, no net increase in health risks from TACs, and no physical increase in GHG emissions. The system also references other materials that have been developed to assist the refinery in maintaining compliance with these requirements. This system will reside on the Refinery's intranet webpage and is accessible to all Refinery personnel.

NPDES or National Pollutant Discharge Elimination System, refers to the Refinery's water effluent permit, which is managed within the Refinery environmental staff.

OA or Operating Assistant is a job title within Richmond Refinery line operations. Operating Assistant duties can include ownership and management of business initiatives within a Business Unit or Division.

OERI or Operational Excellence Reliability Intelligence is a reporting tool that tracks various metrics, including safety, operations, and reliability metrics, by automatically pulling data from the Refinery's information management systems. These systems contain information pertaining to (1) reliability, including design safety and inspection schedules and history, and (2) maintenance management data, including the status of preventative maintenance and safety activities. OERI also tracks the Management of Change process, PHA process recommendations, and regulatory compliance action items.

Operations Emission Tracking Tool or OETT is the Excel-based tool developed in conjunction with the City's third-party environmental consultant to be utilized by the Refinery to track emissions for compliance with CUP/MMRP requirements, including the no net increase in CAP emissions and no physical increase in GHG emissions.

Operator Training Program is the Refinery's program for training new and experienced operators and maintaining qualified operators in the Refinery. The Program includes periodic CBT, face-to-face training, and simulator training methods.

Permasense® is a corrosion monitoring system technology used in the Refinery which provides corrosion detection and monitoring data on piping circuits. These systems include permanently installed ultrasonic corrosion monitoring devices which use waveguide technology to allow them to operate in high temperature environments while being intrinsically safe. The sensors communicate using wireless technology, which includes creating a self-forming and self-managing wireless mesh, to provide continuous wall thickness measurements.

PHA or Process Hazards Analysis is a hazard assessment associated with an industrial process. The Refinery utilizes Refinery Instruction (RI) 363 to manage its PHA process.

PMO or Process Monitoring and Optimization is an Excel-based tool owned and maintained by Process Engineers assigned to ABU to monitor and track process variable concerning optimization, reliability, and environmental conditions of the process unit.

PMS or Parametric Monitoring System measures a parameter that is a key indicator of system performance. The parameter is generally an operational parameter of the process or the air pollution control device that is known to affect the emissions levels from the process or control efficiency of the APCD. Examples of parametric monitoring include temperature, pressure, or flow rate monitoring. [Source: https://www.epa.gov/air-emissions-monitoring-knowledge-base/basic-information-about-air-emissions-monitoring]

PSM or Process Safety Management refers to a set of OHSA regulations focused on managing hazards associated with process industries.

PSM Organization refers to the Refinery personnel responsible for the development and implementation of compliance programs to meet PSM including CalARP, CalOSHA, and RISO regulations.

Refinery is the Chevron Richmond Refinery.

RI or Refinery Instruction refers to internal Chevron instructions for compliance with rules, regulations, practices, or instructions affecting more than one Business Unit or Division within a specific refinery. Richmond Refinery Instructions are issued and maintained by the Richmond Refinery.

RISO is the Richmond Industrial Safety Ordinance (R.M.C. Article VI Chapter 6.43).

RWQCB or Regional Water Quality Control Board refers to the California San Francisco Bay Regional Water Quality Control Board.

SIS or Safety Instrumented Systems refers to process systems with hardware and software controls designed to avoid adverse operation which could result in health, safety, or environmental consequences.

SPCC represents Spill Prevention, Control, and Countermeasure.

Title V Permit Compliance System refers to the Refinery's system for ensuring compliance with the facility's Title V air permit. This system includes monitoring, recordkeeping, and reporting elements.

- Monitoring elements include, but are not limited to: automatic alarms and alerts for Title V permit limits; operational verifications for continuous emission monitors and parametric analyzers; source testing; Operator routine duties; and leak detection and repair program

- Reporting elements include but are not limited to: semi-annual and annual certifications; monthly reports on flare monitoring, continuous emission monitors, ground level monitors, and permit deviations; and notifications for compliance activities, including inoperative monitors, emissions excesses, permit deviations, and start-ups and shutdowns of specified units.

Turnaround refers to refinery maintenance turnarounds which are planned and scheduled events where a process unit or multiple units are taken off-line so that equipment can be inspected, and maintenance performed. Construction projects, or portions of projects, may be executed during a turnaround when equipment or tie-in points become available.

IMPACT Web is a tool utilized by the Refinery to schedule and track completion of turnaround-related activities or tasks.

CHEVRON RICHMOND REFINERY MODERNIZATION PROJECT
Mitigation Monitoring and Reporting Program, Section 4.13-4e
Annual Spent Catalyst Report for Operational Year 2022

LEAD AGENCY
CITY OF RICHMOND
450 CIVIC CENTER PLAZA
RICHMOND, CA 94804

Pursuant to the Chevron Richmond Refinery Modernization Project (Project) Mitigation Monitoring and Reporting Program (MMRP) mitigation measure (MM) 4.13-4e, Chevron is submitting this annual compliance report to the City of Richmond (COR). Pursuant to mitigation measure 4.13-4e:

> "For the additional catalyst identified in Table 4.13-4 (at hydrogen plant and FCC FHT), Chevron will either send spent catalyst for metal reclamation or dispose of the spent catalyst that cannot be reclaimed to a secure and licensed facility. Chevron will maintain records on the amount of catalyst sent for reclamation and for disposal and report to the City annually on these amounts."

As stated in EIR Volume 1, Part 4.13.4.1.1.3.1, generation rates for spent catalyst waste are anticipated to change as a result of the new hydrogen plant due to inventory of hydrodesulfurization and selective catalytic reduction (SCR) catalysts. As a best practice for waste management, spent catalysts containing precious metals and non-precious metals are evaluated for metals reclamation, and pending this evaluation, the "majority of catalysts are reclaimed" at a reclaiming facility offsite. Alternatively, if a spent catalyst does not meet the criteria for reclamation, such as minimum metal concentrations, "disposal at a secure landfill that is licensed to accept these types of wastes is appropriate."

The Chevron Richmond Refinery has not yet completed modifications to the FCC FHT and therefore has not yet triggered the spent catalyst reporting requirement for the FCC FHT under MM 4.13-4e for Operational Year 2022.

The information reported herein pertaining to spent catalyst generation for the new hydrogen plant is based on records maintained by the Chevron Richmond Refinery and is available for review at the Refinery upon request.

Spent Catalyst Generation Summary

Spent catalyst records for the new hydrogen plant during the 2022 operational year (January 1 through December 31), are summarized in Table 1 below.

Table 1 – 2022 Spent Catalyst Generation

Process Plant	Actual, Total Reclaimed (in tons/year)	Actual, Total Disposed (in tons/year)	Actual, Total Reclaimed + Disposed (in tons/year)	Post-Modernization Project, Total Reclaimed + Disposed (in tons/year)
New H2	147.	19.	166.	366

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

June 27, 2023

Chevron Products Company
P O Box 1272
Richmond, CA 94802

Attention: Shawn Lee/Kris Battleson

Application Number 12842
Plant Number: 10
Equipment Location:
841 Chevron Way
Richmond, CA 94801

Dear Applicant:

SUBJECT: AUTHORITY TO CONSTRUCT MODIFICATION OF EXISTING EQUIPMENT

In accordance with Regulation 2-1-407, an Authority to Construct expires two years from the date of issuance unless the Authority to Construct has been renewed. The Authority to Construct issued to you on September 19, 2008 for the following equipment:

S-4253 TKC/FCC Feed Hydrotreater, 96,000 BPD Maximum Capacity

has been renewed. This Authority to Construct will now expire on February 12, 2025.

The equipment described above is subject to condition no. 24136.

Please include your application number with any correspondence with the District. The District's regulations may be viewed online at www.baaqmd.gov. If you have any questions on this matter, please call **Bhagavan R Krishnaswamy, Supervising Air Quality Engineer at (415) 749-4637**.

Very truly yours,

Pamela J. Leong
Director of Engineering

by _____
Air Quality Engineering Manager

GDS:BRK

Attachment: Condition nos. 24136

H:\Engineering\PermitSystems\12842ACEXa

CHEVRON PRODUCTS COMPANY Plant A0010
RENEWAL PROJECT Application No. 12842
841 Chevron Way
Richmond, CA 94802

FUGITIVE EQUIPMENT

1) Fugitive Equipment

Parts 1 through 4 apply to the Renewal Project Continuous Catalyst Regeneration Reformer, Power Plant Replacement, and the Hydrogen Purity Improvements. The Hydrogen Plant fugitive equipment conditions appear in Parts 2, 3, 35, and 36.

a) The Owner/Operator shall as part of the Renewal Project install only the following types of valves in hydrocarbon service as defined in part 2: (1) bellows sealed, (2) live loaded, (3) graphitic packed, (4) quarter-turn (e.g., ball valves or plug valves), or equivalent as determined by the APCO.
[Basis: Cumulative Increase, BACT, Offsets, Regulation 8-18]

b) The Owner/Operator shall comply with a leak standard of 100 ppm of TOC (measured as C1) at any valve installed as part of the Renewal Project in hydrocarbon service as defined in part 2 unless the owner/operator complies with the applicable minimization and repair provisions contained in Regulation 8-18. Valves that are not of a type listed in part 1(a) and for which a leak greater than 100 ppm (measured as C1) has been determined, shall become subject to the inspection provisions contained in Regulation 8-18 unless the component is already subject to the Part 4 inspection frequency. If the leak remains greater than 100 ppm (measured as C1) after repair, or if the valve is determined to have a leak greater than 100 ppm (measured as C1) a second time within a 5-year period, the Owner/Operator shall replace the valve with a type listed in part 1(a) within 5 years or at the next scheduled turnaround, whichever is sooner.
[Basis: BACT, Regulation 8 Rule 18]

c) The Owner/Operator shall install graphitic-based gaskets on all flanges or connectors

(gasketed) installed as part of the Renewal Project in hydrocarbon service as defined in part 2 unless the Owner/Operator demonstrates to the satisfaction of the APCO that the service requirements prevent this gasket material from being used. [Basis: BACT]

d) The Owner/Operator shall comply with a leak standard of 100 ppm of TOC (measured as C1) at any flanges/connectors installed as part of the Renewal Project in hydrocarbon service as defined in part 2 unless the owner/operator complies with the applicable minimization and repair provisions contained in Regulation 8-18.
[Basis: BACT, Regulation 8 Rule 18]

e) The Owner/Operator shall install dual mechanical seals w/ non-VOC barrier fluid (gas or liquid); or seal system with leakage vented to a thermal oxidizer; or oil ring seals with non-VOC/barrier fluid; or other District approved equivalent control device or technology as determined by the APCO on all compressors installed as part of the Renewal Project.
[Basis: BACT]

f) The Owner/Operator shall comply with a leak standard of 100 ppm of TOC (measured as C1) at any pumps and/or compressors installed as part of the Renewal Project in hydrocarbon service as defined in part 2 unless the owner/operator complies with the applicable minimization and repair provisions contained in Regulation 8-18.
[Basis: BACT]

g) The Owner/Operator shall install double mechanical seals w/ barrier fluid; magnetically coupled pumps; canned pumps; magnetic fluid sealing technology; seal system with leakage vented to thermal oxidizer, or other BAAQMD approved equivalent control device; or District approved control technology as determined by the APCO on all pumps installed as part of the Renewal Project in hydrocarbon service as defined in part 2. The Owner/Operator shall install mechanical seals or District approved equivalent technology on all pumps in hydrocarbon service.

All pumps installed as part of the Renewal Project in hydrocarbon service where either the hydrocarbon has an initial boiling point greater than 302 degrees Fahrenheit or a flash point greater than 250 degrees Fahrenheit, shall be subject to quarterly inspection provisions contained in Part 4.c). If any of these pumps is determined to have a leak greater than 100 ppm (measured as C1) and if the leak remains greater than 100 ppm (measured as C1) after repair, or if the pump is determined to have a leak greater than 100 ppm (measured as C1) a second time within a 5-year period, then the owner/operator shall install double mechanical seals w/ barrier fluid; magnetically coupled pumps; canned pumps; magnetic fluid sealing technology; or gas seal system vented to thermal oxidizer or other BAAQMD approved equivalent control device or technology as determined by the APCO within 5 years or at the next scheduled turnaround, whichever is sooner.
[Basis: BACT]

h) The Owner/Operator shall vent all pressure relief valves installed as part of the Renewal Project in hydrocarbon service as defined in part 2 subject to Rule 8-28 to a flare gas recovery system with a recovery and/or destruction efficiency of at least 98% by weight.
[Basis: BACT]

i) Unless the equipment exclusively handles material(s) with a flash point greater than 250F, the Owner/Operator shall identify all new and replacement valves, pressure relief devices, flanges, connectors, process drains, pumps, and compressors installed as part of the Renewal Project in hydrocarbon service as defined in part 2 with a unique permanent identification code and shall include all new and replaced fugitive equipment in the fugitive equipment monitoring and repair program as specified in Parts 1 through 4. The owner/operator shall monitor all repaired equipment within 24 hours of the repair. The unique permanent identification code does not apply to quarter-inch or less tubing and connectors associated with analytical sampling systems.
[Basis: Cumulative Increase, Offsets, BACT]

2) The Owner/Operator shall submit a count of pumps, compressors, valves, pressure relief devices, flanges/connectors, and process drains installed in hydrocarbon service. For the purpose of this condition, hydrocarbon service is defined as all organic compound materials with a flash point less than or equal to 250F or an Initial Boiling Point less than or equal to 302F. The intent of this condition is to extend the monitoring beyond that contained in Rule 8-18 up to the flash point of 250F. The owner/operator shall submit the component count within 30 days of the close of each calendar quarter until completion of project construction. The Owner/Operator has been permitted to install the following number of these hydrocarbon service fugitive components for the Renewal Project, including the Hydrogen Plant Replacement.

Pumps: 43 [As identified in part 1(i)]
Compressors: 46
Valves: 8,932
Pressure Relief Devices: 240
Connectors (No Flanges): 4,718
Flanges: 12,465
Process Drains: 207

The Owner/Operator shall not exceed 15.92 tons per year of POC emissions measured as C1 from all fugitive components included in the above counts, including Hydrogen Plant Replacement fugitive components. Compliance with this provision shall be verified quarterly using methods described in part 3. The results shall be submitted to the District within 30 days of the close of each calendar quarter after commencing with start-up of the first Renewal Project source. The owner/operator shall keep documentation of fugitive component counts and corresponding POC emissions for at least five years from date of entry.

Within 30 days of the completion of the installation of all fugitive components, the owner/operator shall submit a final component count and POC emissions estimate to the District. If any of the fugitive component counts exceed a count stated above, the plant's cumulative increase emissions for the Renewal Project shall be adjusted as needed, subject to APCO approval, to reflect only the difference between emissions based on predicted component

counts versus actual component counts. The Owner/Operator shall provide to the District all additional required offsets at an offset ratio of 1.15:1 no later than 21 days after the submittal of the final POC fugitive equipment count and corresponding final fugitive component POC emissions estimate. If any of the fugitive component counts are less than a count stated above, the total cumulative increase emissions may be adjusted accordingly and emission offsets applied by the owner/operator in excess of the permitted levels may be requested by the owner/operator through the submittal of a banking application.
[Basis: Cumulative Increase, Offsets, Rule 2-5]

2) The Owner/Operator shall calculate fugitive emissions from all Renewal Project fugitive components in hydrocarbon service (including the Hydrogen Plant Replacement) utilizing District approved methods. For leaking components the owner/operator shall use the modified trapezoidal method and LeakDAS as documented within the application 12842 or other method pre-approved by the District. The owner/operator shall include emissions estimates from all Renewal Project fugitive components regardless of the component Rule 8-18 repair status.
[Basis: Cumulative Increase, BACT, Offsets]

4) a) The Owner/Operator shall conduct inspections of Renewal Project fugitive components in hydrocarbon service as defined in Part 2 of these conditions in accordance with the frequency below:

Pumps: Quarterly
Compressors: Quarterly
Valves: Quarterly
Pressure Relief Devices: Quarterly
Process drains: Quarterly
Connectors (Not Flanges): Biannual
Flanges: Biannual
[Basis: BACT, Regulations 8-18, 8-8]

b) The Owner/Operator shall conduct quarterly inspections of all Renewal Project pumps in hydrocarbon service with a flash point less than or equal to 250F.
[Basis: BACT]

c) The Owner/Operator shall conduct quarterly inspections of all Renewal Project pumps in

hydrocarbon service where either the hydrocarbon has an initial boiling point greater than 302 degrees Fahrenheit or a flash point greater than 250 degrees Fahrenheit.
[Basis: BACT]

HYDROGEN PLANT REPLACEMENT

5) The Owner/Operator of Hydrogen Plant Trains (S-4449, S-4450) shall not exceed the following maximum capacity limit for each train:
[Basis: Cumulative Increase]

140 MMSCF of hydrogen, calendar day maximum

6) The Owner/Operator of the Hydrogen Recovery Unit (S-4451) shall not exceed the following maximum capacity limitations: [Basis: Cumulative Increase]

50 MMSCF of hydrogen, calendar day maximum

7) The Owner/Operator shall fire only natural gas (including medium BTU natural gas), or Hydrogen Plant offgas ("PSA tail gas"), in the Hydrogen Plant Reformer Furnaces (S-4471, S-4472). The owner/operator of S-4471 and S-4472 shall not exceed a maximum of 30% natural gas of the total annual fuel usage (Btu basis) with the balance being PSA tail gas.
[Basis: BACT]

8) The Owner/Operator shall abate the S-4471 furnace at all times of operation except startup, shutdown, dryout/warmup, and commissioning periods by the properly operated and properly maintained SCR unit A-0302. The Owner/Operator shall abate the S-4472 furnace at all times of operation except startup, shutdown, dryout/warmup, and commissioning periods by the properly operated and properly maintained SCR unit A-0303.
[Basis: BACT]

9) a) The Owner/Operator shall not exceed the following combined annual limits from the hydrogen plant reformer furnaces (S-4471, S-4472) and hydrogen plant flare (S-6021) in any consecutive 12 month period:
[Basis: Cumulative Increase, 2-2-302, 2-2-303]

Pollutant	Annual (tons)
NOx	64.43
CO	92.28
SO2	5.25

PM10	20.98
POC	28.6

b) The Owner/Operator shall not exceed the following combined annual emissions limits from the hydrogen plant reformer furnaces (S-4471, S-4472) in any consecutive 12 month period:
[Basis: Cumulative Increase, 2-2-302, 2-2-303]

Pollutant	Annual (tons)
NOx	53.28
CO	64.88
SO2	4.94
PM10	20.68
POC	23.22

c) The Owner/Operator shall determine the daily and monthly emissions used to establish rolling annual emissions totals from S-4471 and S-4472 using continuous emission monitor (CEM) data for NOx and CO, and using District approved emission factors shown in part 14 and District-approved fuel consumption data from each S-4471 and S-4472 for PM10 and POC. The owner/operator shall determine daily (with monthly totals) SO2 emissions from the sum of the total sulfur in the natural gas (including medium BTU natural gas) fuel stream and the total sulfur in the feed gas stream ("PSA tail gas"), assuming 100% conversion of total sulfur to SO2. SO2 emissions shall be calculated using a method approved by the APCO. The sulfur in the natural gas fuel stream shall be calculated as the concentration of sulfur in the incoming natural gas supply, as measured daily by an on-stream analyzer, multiplied by the measured flow of natural gas used as fuel. The sulfur in the feed gas stream shall be calculated as the measured total feed gas processed in the desulphurization unit multiplied by the actual total sulfur content either as measured downstream of the desulphurization unit by the continuous on-stream analyzer or that analyzer's lower detection limit, whichever is greater.

The owner/operator of the hydrogen plant flare (S-6021) shall use the emissions factors presented in part 27 in order to demonstrate compliance with the part 9a annual limits.
[Basis: Monitoring, cumulative increase, offsets]

10) For each furnace (S-4471, S-4472), the Owner/Operator shall install, calibrate, maintain, and operate a District-approved CEM and recorder for NOx, CO and O2.
[Basis: Regulation 1-523]

11) The Owner/Operator of S-4471 and S-4472 shall properly install and operate District-approved equipment for continuous fuel flow monitoring and recording in order to determine fuel consumption, at each S-4471 and/or S-4472 using District approved methods. The Btu content of the fuels used at S-4471 and S-4472 shall be calculated or measured hourly at a minimum using a District-approved method. The gas composition analysis and sulfur content of the fuels used at S-4471 and/or S-4472 shall be measured and recorded hourly at a minimum using a District-approved method. Combustion stack flow shall be calculated using a District-approved method from either the fuel flow, gas composition, and combustion stack CEM excess oxygen monitor information, or a flow meter.
[Basis: Monitoring, Cumulative Increase]

12) The Owner/Operator shall not exceed the following maximum heat input limits for each furnace (S-4471, S-4472): (1) 8,059,200 MMBTUs (HHV) in any consecutive 12 month period, and (2) 950 MMBTUs (HHV)/hr averaged over any calendar day.
[Basis: Cumulative Increase, Offsets]

13) The "Commissioning Period" is a one-time occurrence for each furnace, that shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed for that furnace. The Commissioning Period for each furnace shall terminate when the furnace has completed performance testing and is available for operation. In no event shall the Commissioning Period for either furnace exceed 90 days unless the applicant has made a written request for an extension and the District has granted such an extension. The commencement of the Commissioning Period shall be considered the date of initial operation for the Authority to Construct. The final startup conducted at the end of the Commissioning Period shall be considered the initial startup.

b)"Commissioning Activities" shall be defined as

all testing, adjustment, tuning, and calibration activities during the Commissioning Period, recommended by the equipment manufacturers and the construction contractor, to insure safe and reliable steady state operation of the hydrogen plant reformer furnace and associated systems.
[Basis: cumulative increase, offsets]

i) The Owner/Operator of S-4471 and S-4472 shall submit a District-approved commissioning plan that includes all commissioning activities and corresponding commissioning emissions estimates and monitoring within 60 days prior to any commissioning activities.
[Basis: Cumulative Increase]

c) The following conditions shall apply during the Commissioning Period and Commissioning Activities:

i. During the Commissioning Period, the Owner/Operator shall demonstrate compliance with parts ii through iii below through the use of properly operated and properly maintained continuous emission monitors and data recorders for the following parameters:

- firing hours;
- fuel flow rates (calculated exhaust flow rate or measured exhaust flow rate);
- stack gas nitrogen oxide emission concentrations;
- stack gas carbon monoxide emission concentrations; and
- stack gas oxygen concentrations.

ii. The Owner/Operator shall not exceed 300 hours for each furnace during the Commissioning Period of S-4471 and S-4472 hydrogen plant reformer furnaces without abatement by A-302 and A-303 SCR Systems, respectively. Such operation of the S-4471 and S-4472 hydrogen plant reformer furnaces without abatement shall be limited to discrete Commissioning Activities that can only be properly executed without the SCR system in operation. Upon completion of these activities for each furnace, the owner/operator shall provide written notice to the District and the unused balance of the 300 firing hours per furnace without abatement shall expire. The

Owner/Operator shall maintain records of all furnace firing hours without the SCR systems in place and operational.
(Basis: offsets)

iii. The total mass emissions of NOx, CO, POC, PM10, and SO2 that are emitted by the S-4471 and S-4472 hydrogen plant reformer furnaces during the commissioning period shall be included towards the consecutive twelve-month emission limitations specified in part 9.
(Basis: offsets)

d)"Startup" shall mean that period of time including Furnace Startup as defined in part 13e and the introduction of hydrocarbon feedstock to the Hydrogen Plant S-4449 and S-4450, ending with the full routing of the PSA tail gas to either of the respective furnaces. The period of time from the introduction of hydrocarbon feedstock to S-4449 and S-4450 to the end of startup shall not exceed 8 hours. Each individual " Startup", which includes Furnace Startup, shall not exceed 24 hours except during the "Commissioning Period". For S-4449, " Startup" is completed once PV-17004 PSA1 Tail Gas to Flare Control Valve, has been closed for 30 minutes. For S-4450, " Startup" is completed once PV-27004 PSA2 Tail Gas to Flare Control Valve, has been closed for 30 minutes. If "Startup" shall be interrupted before completion, the resumed startup activities shall constitute a second "Startup" with its own time limitations.

e)"Furnace Startup" shall mean that period of time during which the furnace is put into service immediately following "Commissioning Period" as defined in part 13a, or any subsequent shutdown, by following a prescribed series of separate steps or operations. "Furnace Startup" shall be initiated when the furnace begins to receive fuel flow from its inactive, pre-startup temperature up to the point where the respective SCR unit is placed in operation in accordance with part 16. If "Furnace Startup" shall be interrupted before completion, the resumed furnace startup activities shall constitute a second "Furnace Startup" with its own time limitations.

i)The Owner/Operator of Furnaces S-4471 and S-

4472 shall not exceed a combined total of 132 consecutive hours during any consecutive 12-month period for "Furnace Startup". The owner/operator of each individual "Furnace Startup" shall not exceed 20 hours for each hydrogen plant reformer furnace (S-4471 and S-4472) except during the "Commissioning Period".

f)"Shutdown" shall mean that period of time during which the furnace is taken out of service following a prescribed series of separate steps or operations including clearing the reformer system piping of combustibles. "Shutdown" for each furnace S-4471 and S-4472 is initiated once ammonia injection into the respective SCR units (A-0302, A-0303) has been stopped in accordance with part 16. The end of shutdown is reached when the fuel supply to the reformer has been shut off and reformer system piping has been cleared of combustibles.

g) Except during the commissioning period, the Owner/Operator of S-4471 and S-4472 shall not exceed the following operation limitations for either furnace:

(1) Each "Shutdown" shall not exceed 9 consecutive hours.

h) The owner/operator shall not exceed 600 hours of total combined hours of Startup and Shutdown in any consecutive 12-month period. To demonstrate compliance with this part, the owner/operator shall maintain a District-approved log of the total time in hours and minutes of each Startup and Shutdown as defined in parts (d), (e), (f), and (g) above. The log shall be retained for five years of date of entry and shall be made available to District staff upon request.

i)"Dryout/warmup" shall mean an event that occurs during the Commissioning Period and whenever new hydrogen plant reformer furnace refractory has been installed. When this new refractory is heated for the first time, the hydrogen plant reformer furnace is brought gradually to operating temperature through a series of prescribed steps designed to ensure safe operation of the furnace.

j) Except during the commissioning period, the Owner/Operator of S-4471 and S-4472 shall not exceed the following operation limitation for either furnace:

(1) Each "Dryout/Warmup" of new furnace refractory heating shall not exceed 120 hours.

14) The Owner/Operator of S-4471 and S-4472 shall not exceed the following emission limits at each furnace except during startup, shutdown, dryout/warmup, and commissioning periods, unless specifically noted below:

a) NOx emissions - 5.0 ppmv, dry, corrected to 3% oxygen, averaged over any 1 hour period. Note: This NOx emissions limit applies at times of operation of A-302 and A-303 as required in Part 16 of these conditions, when the catalyst bed is equal to or greater than 562 degrees F.;
[Basis: BACT]

b) CO emissions - 10.0 ppmv, dry, corrected to 3% oxygen averaged over any 1 hour period;
[Basis: BACT]

c) PM10 emissions - 0.0026 lb/MMBtu (HHV), averaged over 3 hours; [Basis: BACT] and

d) POC emissions - 0.00288 lb/MMBtu (HHV), averaged over 3 hours.

e) SO2 emissions - See part 9c.

[Basis: BACT, cumulative increase]

15) The Owner/Operator of S-4471 and S-4472 shall demonstrate compliance with part 14 using a District-approved CEM for NOx and CO, and using District-approved fuel consumption and emission factors verified through District-approved source tests as specified in parts 17 and 18 for PM10 and POC. The owner/operator of S-4471 and S-4472 shall determine the SO2 emissions as specified in condition part 9c.
[Basis: BACT]

16) The Owner/Operator of A-0302 and A-0303 shall operate A-302 and/or A-303 at all times of operation of S-4471 and/or S-4472, respectively, when the catalyst bed is equal to or greater than 500 degrees Fahrenheit except for during

dryout/warmup. The Owner/Operator of A-0302 and A-0303 shall not exceed the following ammonia emission limits except during periods of startup, shutdown, dryout/warmup, and Commissioning unless otherwise specified: 10 ppmv of ammonia, dry, corrected to 3% oxygen, as verified by District approved source test method, not to exceed three hours averaging time. The owner/operator shall maintain the catalyst bed above 500 degrees at all times of operation of S-4471 and S-4472, except during startup, shutdown, or dryout/warmup of S-4471 or S-4472 as specified in part 13.
[Basis:oxics, BACT]

a) The Owner/Operator shall not inject ammonia into the SCR units (A0302, A-0303) until the catalyst bed reaches 500 degrees Fahrenheit. During startup, the owner/operator shall start injecting ammonia as soon as practicable, but under no circumstances later than the lesser of either: 30 minutes from when the catalyst bed reaches 500 degrees Fahrenheit or the catalyst bed reaching a temperature of 562 degrees F. During shutdown, the owner/operator shall stop injecting ammonia when the catalyst bed reaches 500 degrees Fahrenheit. The Owner/Operator shall properly install and operate a control valve that automatically shuts off the ammonia injection when the catalyst bed reaches 500 degrees Fahrenheit during shutdown. The Owner/Operator shall maintain records that demonstrate the temperature during all times of operation of S-4471 and/or S-4472 and the times that the ammonia injection to the SCR unit(s) (A-302/303) begins and ends.

17) The Owner/Operator of S-4471 and S-4472 shall conduct a District-approved source test within 120 days of the initial startup date of each plant to demonstrate compliance with the limits in parts 9, 14 and 16 for POC, PM10, SO2, and ammonia slip. The Owner/Operator shall conduct the District-approved source tests in accordance with parts 18, and with the applicable parts of 109 through 117. The Owner/Operator shall submit the District approved source test results to the District no later than 60 days from the date of the source test.
[Basis: BACT, Cumulative Increase, Offsets]

18) The Owner/Operator of S-4471 and S-4472 shall follow either (a) or (b) below to demonstrate subsequent compliance with the POC, PM10, and SO2 mass emission rates specified in parts 9 and 14 and the ammonia slip limit in part 16:

a) The Owner/Operator shall install, calibrate, and maintain a District approved continuous emission monitor and recorder for ammonia slip to demonstrate subsequent compliance with the ammonia slip limit in part 16. The Owner/Operator shall conduct one reference test or use the test from part 17 to demonstrate accuracy of the continuous emission monitor. After the initial source test, the Owner/Operator shall conduct three quarterly District approved source tests, followed by two semi-annual District approved source tests to demonstrate subsequent compliance with the POC, and PM10 mass emission rates specified in parts 9 and 14 and the ammonia slip limit in part 16. After the additional source tests specified in this part 18.a. have been completed, the Owner/Operator shall conduct a district approved source test in each subsequent calendar year to demonstrate compliance with the POC and PM10 mass emission rates specified in parts 9 and 14. Each subsequent calendar year source test shall be at least nine months apart, but not more than 15 months apart. The Owner/Operator may conduct less frequent source tests upon approval by the District. The owner/operator may be required by the APCO to conduct more frequent source tests if source test results indicate POC, SO2, and/or PM10 emissions are either within 90% of a limit or exceeding a limit specified in parts 9 and/or 14. The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of 109 through 117. The Owner/Operator shall submit the source test results to the District staff no later than 60 days from the date of the source test; or

b) After the initial source test specified in part 17 has been completed, the Owner/Operator of S-4471 and S-4472 shall conduct three quarterly District approved source tests, followed by two semi-annual District approved source tests to

demonstrate subsequent compliance with the POC, and PM10 mass emission rates specified in part 14 and the ammonia slip limit in part 16. After the additional source tests specified in this part 18.b. have been completed, the Owner/Operator shall conduct a source test in each subsequent calendar year. Each subsequent calendar year source test shall be at least nine months apart. The Owner/Operator may conduct less frequent source tests upon approval by the District. The owner/operator may be required by the APCO to conduct more frequent source tests if source test results indicate POC, PM10, SO2, and/or ammonia slip emissions are within 90% of an emissions limit or exceeding an emissions limit specified in parts 9, 14 and/or 16. The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of 109 through 117. The Owner/Operator shall submit the source test results to the District staff no later than 60 days from the date of the source test. [Basis: Periodic Monitoring, cumulative increase]

19) The Owner/Operator of S-4471 and S-4472 shall not exceed the following emission limits: [Basis: Rule 2-5]

S-4471 Train 1 Hydrogen Furnace

Arsenic	13.8 lb/yr
Cadmium	9.82 lb/yr
Nickel	81.4 lb/yr

S-4472 Train 2 Hydrogen Furnace

Arsenic	13.8 lb/yr
Cadmium	9.82 lb/yr
Nickel	81.4 lb/yr

If source test results indicate that other toxic air contaminants not identified above are emitted at rates greater than evaluated prior to the issuance of the Authority to Construct, then the owner/operator shall re-run the HRSA to determine compliance with Regulation 2, Rule 5 and potentially add these compounds to the lists above.

20) The Owner/Operator of S-4471 and S-4472 shall

conduct District approved source tests in accordance with part 109 through 117 to demonstrate compliance with the limits in part 19. The Owner/Operator may conduct less frequent source tests upon approval by the District. The owner/operator may be required by the APCO to conduct more frequent source tests if source test results indicate emissions are either within 90% of any part 19 emissions limit or exceeds any part 19 emissions limit. The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of 109 through 117.
[Basis: Rule 2-5, Source Tests]

Hydrogen Plant Cooling Water Tower (S-4465)

21) The Owner/Operator of S-4465 shall not exceed 51,840,000 gallons per calendar day of cooling water tower recirculation rate through the process equipment system. The owner/operator shall maintain a District-approved daily log of the total throughput (including cooling water tower recirculation rate) at S-4465. This log shall be kept on site for at least 5 years from the date of entry and be made available to District staff upon request.
[Basis: Cumulative Increase, Offsets]

22) The Owner/Operator of S-4465 shall conduct a District approved flow determination within 60 days of initial startup to demonstrate compliance with part 21 using the cooling tower water pump curves or other method approved by the APCO.
[Basis: Cumulative Increase, Offsets]

23) The Owner/Operator of S-4465 shall not exceed 5000 milligrams per liter total dissolved solids in the cooling tower. The Owner/Operator shall sample the cooling tower water on a monthly basis to determine total dissolved solids (TDS) content. The owner/operator shall calculate TDS from the result of a conductivity measurement in units of micromhos per centimeter (µmhos/cm) multiplied by 0.62 or other District-approved method. The PM10 emissions from the cooling tower drift shall not exceed 10.8 pounds per day or 1.97 tons per year, based on a 51,840,000 gallons per day recirculation rate, 5000 milligrams per liter of TDS, and a drift factor of 0.0005 percent.

[Basis: Cumulative Increase, Offsets]

24) The Owner/Operator shall not emit VOC from S-4465, except as allowed in part 25.
[Basis: Cumulative Increase, Offsets]

25) The Owner/Operator of S-4465 shall inspect the riser chamber in the cooling water return line to the cooling tower on a daily basis for a hydrocarbon leak using a District-approved method. If a leak is detected, the owner/operator shall both identify and repair the leak within 15 days. As part of the Renewal Project, POC emission reduction credits (ERCs) were provided to the District to cover 15 days (360 hours) of hydrocarbon leakage over any consecutive 12-month period. The Owner/Operator of S-4465 shall not exceed a POC emissions limit of either 36.0 lb/day or 0.27 tons/year. Should any leak occur for more than 360 hours in any consecutive 12-month period, the owner/operator shall submit to the District a permit application for a change of condition containing both an emissions estimate to be approved by the APCO and POC emission reduction credits (ERCs) to offset emissions from the leak of any hydrocarbon leakage in excess of 360 hours over any consecutive 12-month period at a ratio specified in Regulation 2, Rule 2. ERCs will be calculated as part of the permit application process.
[Basis: Cumulative Increase, BACT, Offsets]

Hydrogen Plant Flare (S-6021/A-6021)

26) The Owner/Operator of the hydrogen plant flare S-6021 shall design S-6021 to maintain a hydrocarbon and carbon monoxide destruction efficiency of at least 98%, on a mass basis when the gases vented to the flare have a minimum lower heating value (LHV) greater than or equal to 300 BTU/scf, or at least 93%, on a mass basis when the gases vented to the flare have a minimum LHV below 300 BTU/scf.
[Basis: Rule 12-11-401.9]

27) The Owner/Operator shall calculate S-6021 flare emissions for compliance with part 9a annual limits by using the following emission factors (including flare pilot and vented gas emissions):

a) NOx emissions - 0.068 lb/MMBtu for each

combustible to be flared

b) CO emissions - 0.37 lb/MMBtu for flaring of natural gas, RPG, and methane. CO emissions for flaring will be calculated as 2.0% of CO concentration multiplied by the flow rate when fuel has lower heating value (LHV) greater than or equal to 300 BTU/scf and 7.0% of CO concentration multiplied by the flow rate when fuel has lower heating value less than 300 BTU/scf, unless both of the following parameters are satisfied:

i) The owner/operator may assume 98% destruction efficiency during flaring events when the LHV is less than 300 BTU/scf provided that the flare tip velocity does not exceed 122 feet/second. The owner/operator shall continuously monitor and record the flare tip velocity during all events, and

ii) The hydrogen content of the vent gas to the flare shall be maintained at a minimum of 15.5% by volume on a wet basis. The hydrogen content of the vent gas to the flared shall be continuously monitored and recorded during all events.

If both of the above parameters are satisfied, then 2.0% of CO shall be used in the flare emissions estimate for purposes of BACT, not for Rule 12-11 purposes. If either of the above parameters is not satisfied or if information is not available, then 7.0% of the CO shall be used in the flare emissions estimate. [Basis: BACT]

c) POC emissions - 0.14 lb/MMBtu for flaring of natural gas, RPG and methane. POC emissions for flaring will be calculated as 2.0% of POC concentration multiplied by the flow rate when fuel has lower heating value (LHV) greater than or equal to 300 BTU/scf and 7.0% of POC concentration multiplied by the flow rate when fuel has lower heating value less than 300 BTU/scf, unless both of the following parameters are satisfied:

i) The owner/operator may assume 98% destruction efficiency during flaring events when the LHV is less than 300 BTU/scf provided that the flare tip velocity does not exceed 122 feet/second.

The owner/operator shall continuously monitor and record the flare tip velocity during all events, and

ii) The hydrogen content of the vent gas to the flare shall be maintained at a minimum of 15.5% by volume on a wet basis. The hydrogen content of the vent gas to the flared shall be continuously monitored and recorded during all events.

If both of the above parameters are satisfied, then 2.0% of POC shall be used in the flare emissions estimate for purposes of BACT, not for Rule 12-11 purposes. If either of the above parameters is not satisfied or if information is not available, then 7.0% of the POC shall be used in the flare emissions estimate.
[Basis: BACT]

d) PM10 emissions - 0.00745 lb/MMBtu for flaring of natural gas, RPG, CO and methane.

e) SO2 emissions - Calculated from both the fuel usage and total sulfur in the fuel to the flare pilot (burner) and the flow rate and total sulfur content of the vent gasto be flared assuming 100% conversion of total sulfur to SO2.
[Basis: Cumulative Increase]

28) The owner/operator shall fire S-6021 flare pilots continuously with only natural gas. When flaring gas containing refinery process gas (RPG) and/or refinery fuel gas (RFG), the owner/operator of S-6021 flare shall only operate the flare during periods of planned startup, planned shutdown, emergency upset and breakdown. When flaring gas containing no RPG or RFG, the owner/operator of S-6021 flare shall only operate the flare in accordance with the District-approved Flare Minimization Plan (FMP) for the Chevron Richmond Refinery. The owner/operator of S-6021 shall not exceed the maximum design capacity of 217,000 lb/hour of vent gas to the flare as defined in Regulation 12-11-210. The owner/operator of S-6021 shall use steam assist at S-6021 during all times that vent gas is being sent to S-6021.
[Basis: BACT]

29) For the purposes of these conditions, a flaring event is defined as a flow rate of vent gas flared in any consecutive 15-minute period

that continuously exceeds 330 standard cubic feet per minute (scfm). If during a flaring event, the vent gas flow rate drops below 330 scfm and then increases above 330 scfm within 30 minutes, that shall still be considered a single flaring event, rather than two separate events. For each flaring event during daylight hours (between sunrise and sunset), the Owner/Operator shall inspect the flare within 15 minutes of determining the flaring event, and within 30 minutes of the last inspection thereafter, using District-approved video monitoring or District-approved visible inspection following the procedure described in part 30b. [Basis: Regulation 12-12]

30) The Owner/Operator shall use the following procedure for the initial inspection and each subsequent 30-minute inspection of a flaring event.

a) If the Owner/Operator can determine that there are no visible emissions using District-approved video monitoring, then no further monitoring is necessary for that particular inspection.

b) If the Owner/Operator cannot determine that there are no visible emissions using video monitoring, the Owner/Operator shall conduct a visual inspection outdoors using either:

i) EPA Reference Method 9, or
ii) Survey the flare by selecting a position that enables a clear view of the flare at least 15 feet, but not more than 0.25 miles, from the emission source, where the sun is not directly in the observer's eyes.

c) If a visible emission is observed, the Owner/Operator shall continue to monitor the flare for at least 3 minutes, or until there are no visible emissions, whichever is shorter.

d) The Owner/Operator shall repeat the inspection procedure for the duration of the flaring event, or until a violation is documented in accordance with part 31. After a violation is documented, no further inspections are required until the beginning of a new calendar day.

[Basis: Regulation 6-301, 2-1-403]

31) The Owner/Operator of S-6021 shall comply with one of the following requirements if visual inspection is used:
a) If EPA Method 9 is used, the Owner/Operator shall comply with Regulation 6-301 when operating the flare.
b) If the procedure of part 30.b.ii is used, the Owner/Operator shall not operate a flare that has visible emissions for three consecutive minutes.
[Basis: Regulation 2-6-403]

32) The Owner/Operator of S-6021 shall maintain records of all flaring events, as defined in part 29 for a period of five years from the date of entry. These records shall be kept onsite and made available to District staff upon request. The Owner/Operator shall include in the records the name of the person performing the visible emissions check, whether video inspection or visual monitoring (EPA Method 9 or visual inspection procedure of part 30) was used, the results of each inspection, and whether any violation of this condition (using visual inspection procedure in part 30) or Regulation 6-301 (using EPA method 9) occurred.
[Basis: Regulation 2-6-501; 2-6-409.2]

33) The owner/operator of S-6021 shall comply with the monitoring, recordkeeping and reporting requirements for the flare as outlined in Regulation 12-11. The owner/operator of S-6021 shall properly install, maintain, and operate a District-approved total sulfur monitor in the flare gas. In order to demonstrate compliance with Parts 9a, 27, 28, the owner/operator shall maintain records of the lower heating value (BTU/scf) of the vented gas for each flaring event and if the flare vent gas contained any RPG or RFG. The owner/operator of S-6021 shall properly install and operate the pilot and purge monitoring as required in Sections 12-11-503 and 12-11-504.
[Basis: Regulation 12-11]

34) The Owner/Operator of S-6021 shall operate the flare in accordance with the District-approved Flare Minimization Plan (FMP) for the Chevron Richmond Refinery.
[Basis: Regulation 12- 12]

Hydrogen Plant Fugitives

35) Fugitive Equipment

a) The Owner/Operator of all Hydrogen Plant sources (S-4449, S-4450, S-4451, S-4471, S-4472, and S-6021) shall install only the following types of valves in RPG, RFG and/or natural gas service (1) bellows sealed, (2) live loaded, (3) graphitic packed, (4) Teflon packed, (5) quarter-turn (e.g., ball valves or plug valves), or equivalent as determined by the APCO.
[Basis: Cumulative Increase, BACT, Offsets, 8-18]

b) The Owner/Operator of all Hydrogen Plant sources (S-4449, S-4450, S-4451, S-4471, S-4472, and S-6021) shall comply with a leak standard of 100 ppm of TOC (measured as C1) at any valve installed as part of the Hydrogen Plant in RPG, RFG, natural gas, methane, and/or process gas service unless the owner/operator complies with the applicable minimization and repair provisions contained in Regulation 8-18. Valves that are not of a type listed in part 35(a) and for which a leak greater than 100 ppm (measured as C1) has been determined, shall become subject to the inspection provisions contained in Regulation 8-18-401 unless the component is already subject to the Part 36 inspection frequency. If the leak remains greater than 100 ppm (measured as C1) after repair, or if the valve is determined to have a leak greater than 100 ppm (measured as C1) a second time within a 5-year period, the Owner/Operator shall replace the valve with a type listed in part 35(a) within 5 years or at the next scheduled turnaround, whichever is sooner. Methane service shall be any stream that contains any methane. For the purposes of these permit conditions, RPG is refinery process gas and RFG is refinery fuel gas.
[Basis: BACT, Regulation 8 Rule 18]

c) The Owner/Operator of all Hydrogen Plant sources (S-4449, S-4450, S-4451, S-4471, S-4472, and S-6021) shall install as part of this project graphitic-based gaskets on all flanges or connectors (gasketed) installed in natural gas, process gas, RPG and/or RFG service unless the Owner/Operator demonstrates to the satisfaction of the APCO that the service requirements prevent this material from being used.
[Basis: BACT]

d) The Owner/Operator of all Hydrogen Plant sources (S-4449, S-4450, S-4451, S-4471, S-4472, and S-6021) shall comply with a leak standard of 100 ppm of TOC (measured as C1) at any flanges/connectors installed as part of the Hydrogen Plant in RPG, RFG, methane, and/or natural gas service unless the owner/operator complies with the applicable minimization and repair provisions contained in Regulation 8-18.
[Basis: BACT, Regulation 8 Rule 18]

e) The owner/operator shall install liquid seals with non-VOC purge fluid (gas or liquid) or dual dry gas mechanical seals with inert/non-VOC purge gas or dual dry gas mechanical seals with venting to an approved recovery/abatement device or other BAAQMD Approved control device or technology on all compressors installed in TOC service as part of the Renewal Project or other BAAQMD Approved control device or technology. [Waiting for Praxair information on proposed seals.]
[Basis: BACT]

f) The Owner/Operator shall comply with a leak standard of 100 ppm of TOC (measured as C1) at any pumps and/or compressors installed in RPG, RFG, and/or natural gas service as part of the Hydrogen Plant sources (S-4449, S-4450, S-4451, S-4471, S-4472, and S-6021) unless the owner/operator complies with the applicable minimization and repair provisions contained in Regulation 8-18.
[Basis: BACT]

g) The Owner/Operator shall install dual mechanical seals, vented to a District approved abatement device that achieves a minimum of 95% VOC destruction efficiency or District approved equivalent technology as determined by the APCO on all pumps in RPG, RFG, and/or natural gas service installed as part of the Hydrogen Plant sources (S-4449, S-4450, S-4451, S-4471, S-4472, and S-6021).
[Basis: BACT]

h) The Owner/Operator shall vent all pressure relief valves in hydrocarbon service subject to Rule 8-28 to a furnace or flare with a destruction efficiency of at least 98% by weight. Hydrocarbon service as defined in Part

2 of these conditions.

i) The Owner/Operator shall identify all new valves, pressure relief devices, flanges, connectors, process drains, pumps, and compressors installed in RPG, natural gas, methane, and/or RFG service as part of the Hydrogen Plant sources (S-4449, S-4450, S-4451, S-4471, S-4472, and S-6021) with a unique permanent identification code. This identification code does not apply to quarter-inch or less tubing and connectors associated with analytical sampling systems. The owner/operator shall clearly identify the fugitive components listed above that are in methane service only. The Owner/Operator shall include all new fugitive equipment in the fugitive equipment monitoring and repair program.
[Basis: Rule 8-18 (includes methane), cumulative increase, offsets, BACT]

j) The owner/operator of all fugitive components at the Hydrogen Plant sources (S-4449, S-4450, S-4451, S-4471, S-4472, and S-6021) shall handle only RPG, RFG, natural gas, and methane.
[basis: BACT, 8-18, 2-5}

36) The Owner/Operator of all Hydrogen Plant sources (S-4449, S-4450, S-4451, S-4471, S-4472, and S-6021) shall conduct inspections of all Hydrogen Plant sources fugitive components in RPG, RFG, and/or natural gas service based on the frequency below:

Pumps:	Quarterly
Compressors:	Quarterly
Valves:	Quarterly
Pressure Relief Devices:	Quarterly
Connectors (No Flanges):	Biannual
Flanges:	Biannual
Process Drains:	Quarterly

The Owner/Operator of all Hydrogen Plant sources (S-4449, S-4450, S-4451, S-4471, S-4472, and S-6021) shall conduct inspections of all Hydrogen Plant sources' fugitive components exclusively in methane service in accordance with the frequencies specified in Rule 8-18.
[Basis: BACT, Regulation 8-18]

Hydrogen Plant General Recordkeeping

37) The Owner/Operator of S-4449, S-4450, S-4451, S-4471, S-4465, S-4472, S-6021, A-302, A-303, A-6021 shall maintain all CEM and all source testing records and the following associated records (i.e. fuel usage rates, HHV heat content of fuel, hours of operation, flow rates used for emissions calculations, daily, monthly, and annual mass emissions estimates, etc.) for the last 5 years of operation to verify compliance with Renewal Project permit conditions.
[Basis: Recordkeeping]

a) For part 11, continuous fuel flow and gas component analysis records and calculations of combustion stack flow.

b) For part 12, daily, monthly, and consecutive 12 month heat input (HHV) to each furnace (S-4471, S-4472).

c) For part 13)c)i, firing hours, fuel flow rates, and stack gas concentrations.

d) For part 13)c)i, 14, and part 15, the CEMS records for each furnace (S-4471, S-4472).

e) For part 13)c)ii, all furnace firing hours without the SCR in place and operational.

f) Throughput for parts 5,6, 21

g) Emissions data for parts 9, 14,15, 16, 18, 19, 23, 25, 27, all source test results required within parts 5- 36 [BAAQMD recordkeeping]

38) The Owner/Operator shall maintain the following in a District-approved daily log and shall keep these records on site for a period of at least 5 years from date of entry and make the records available to District staff upon request.
[Basis: Regulation 2-1-301, Recordkeeping]

In order to demonstrate compliance with part 5, the Owner/Operator shall maintain the daily, monthly, and consecutive 365-day total record of hydrogen production (MMSCF of H2 per day) for each new Hydrogen Plant Train (S-4449, S-4450);

In order to demonstrate compliance with part 6, the owner/operator shall maintain daily, monthly, and consecutive 365-day total record of hydrogen production at S-4451; and In order to

demonstrate compliance with part 7,the owner/operator shall maintain daily, monthly, and consecutive 365-day total record of all fuel usage at S-4471 and S-4472.

POWER PLANT REPLACEMENT S-4473 S-4474

Third Cogen Gas Turbine and Duct Burner

39) The Owner/Operator of S-4473 gas turbine shall only fire the gas turbine on natural gas (including medium BTU natural gas) and/or LPG (including pentanes). The Owner/Operator of the S-4474 HRSG duct burner shall only fire the duct burner on natural gas (including medium BTU natural gas) and/or refinery fuel gas. [Basis: BACT, cumulative increase]

40) The Owner/Operator of the S-4474 duct burner shall only operate the duct burner while the gas turbine is firing fuel. [Basis: BACT]

41) The Owner/Operator shall abate the S-4473 gas turbine and S-4474 duct burner at all times of operation except startup, shutdown, dryout/warmup, and commissioning periods by both the properly operated and properly maintained SCR unit A-0074 and A-0075 Oxidation Catalyst. [Basis: BACT]

42) The Owner/Operator of the S-4473 gas turbine and S-4474 duct burner shall not exceed the following combined emission limits as measured at the common emission point of S-4473 and S-4474 in any consecutive 12-month period: [Basis: Cumulative Increase, Offsets, BACT]

Pollutant	Annual (tons/year)
NOx	33.91 (See part 105)
CO	49.49
SO2	11.52 (See parts 98 and 99)
PM10	21.12
POC	9.44
Sulfuric Acid Mist	15.09

The Owner/Operator shall demonstrate compliance with part 42 using District-approved CEM system data for NOx, CO, and O2 and using District approved fuel consumption data and the District approved emission factors verified through District approved source tests stated in parts

49, 52, and 53 for Sulfuric Acid Mist, PM10 and POC. The owner/operator shall determine SO2 emissions through the use of fuel usage and fuel sulfur content assuming 100% conversion of total sulfur to SO2 as described in part 99.
[Basis: BACT/offsets]

43) The Owner/Operator shall properly install, calibrate, maintain, and operate a District-approved continuous emissions monitors and recorder for NOx, CO, and O2 at the S-4473/S-4474 emission point (P-0306).
[Basis: Regulation 1-523]

44) The Owner/Operator of S-4473 gas turbine and S-4474 duct burner shall properly install, calibrate, maintain, and operate a District-approved continuous fuel flow monitors and recorders in order to determine both fuel consumption and exhaust gas flowrate for mass emissions.
[Basis: Cumulative Increase, Offsets]

45) The Owner/Operator shall not exceed 550 MMBtu/hr averaged over any calendar day and 520 MMBtu/hr averaged over any consecutive 12-month period for the S-4473 gas turbine, 350 MMBtu/hr averaged over any calendar day and 320 MMBtu/hr averaged over any consecutive 12-month period for the S-4474 duct burner, and 860 MMBtu/hr averaged over any calendar day for both S-4473 and S-4474 combined.
[Basis: Offsets, Cumulative Increase, Rule 2-5]

46) Startup and Shutdown Modes for S-4473 and S-4474. The Owner/Operator shall limit startup of the S-4473 gas turbine and S-4474 HRSG duct burner to the lesser of the first 256 minutes of continuous fuel flow to the gas turbine/duct burner after fuel flow is initiated or the period of time from fuel flow initiation until the gas turbine/duct burner achieves 60 consecutive minutes of CEM data points in compliance with the NOx and CO emission concentration limits. The Owner/Operator shall limit shutdown of the S-4473 gas turbine and S-4474 duct burner to the lesser of 30-minute period immediately prior to the termination of fuel flow to S-4473 or the period of time from non-compliance with the NOx or CO emission concentration limits untiltermination of fuel flow to the Gas Turbine/HRSG. Startup and shutdown emissions shall accrue toward the

consecutive twelve-month emission limitations specified in part 42.
[Basis: Time allowances for startup and shutdown periods]

47) Commissioning Period. A one-time occurrence that shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed. The Commissioning Period shall terminate when the gas turbine and duct burner have completed performance testing and are available for operation. In no event shall the Commissioning Period exceed 90 days unless the applicant has made a written request for an extension and the District has granted the extension in writing. The commencement of the Commissioning Period shall be considered the date of initial operation for the Authority to Construct. The final startup conducted at the end of the Commissioning Period shall be considered the initial startup.
[Basis: Definition, cumulative increase]

48) Commissioning Activities. All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and construction contractor to ensure safe and reliable steady state operation of the S-4473 gas turbine, S-4474 duct burner/HRSG, and associated electrical delivery systems. Commissioning Activities are considered to be a one-time occurrence.

a) The Owner/Operator of S-4473 and 4474 shall submit a District-approved commissioning plan that includes all commissioning activities and corresponding commissioning emissions estimates and monitoring within 60 days prior to any commissioning activities.
[Basis: Cumulative Increase]
[Basis: Definition, cumulative increase]

49) The Owner/Operator shall not exceed the following emission limits from the combined firing of S-4473 gas turbine and S-4474 duct burner except during startup and shutdown, and commissioning periods.

NOx - 2.0 ppmv, dry, corrected to 15% oxygen, averaged over any 3 consecutive hours; and 2.5 ppmv, dry, corrected to 15% oxygen, averaged over any 1 hour;

CO emissions - 6.0 ppmv, dry, corrected to 15% oxygen, averaged over any 3 consecutive hours;

POC emissions - 2.0 ppmv, dry, corrected to 15% oxygen, averaged over any District-approved compliance source test not to exceed 3 hours; and PM10 emissions - 0.00574 lb/MMBtu, averaged over any District-approved compliance source test not to exceed 3 hours.

Should PM10 emissions exceed the above emission limit, the Owner/Operator may submit a change of conditions application for amendment of the limit upon District approval. Such application shall include a demonstration that the S-4473 gas turbine and S-4474 duct burner are properly designed and properly operating with good combustion practices that satisfy the BACT requirement and that Renewal Project components remain below PSD and CEQA significance thresholds. The application shall also provide emission reduction credits (ERCs) as needed to offset the higher PM10 limits and specify a sulfur limit for the refinery fuel gas combusted in the S-4474 duct burner. [Basis: BACT, cumulative increase]

50) The Owner/Operator of S-4473 and S-4474 shall monitor compliance with parts 42 and 49 by using a District-approved CEMs system for NOx, CO, and O2, and by District approved emissions factors verified through district approved source tests and District-approved fuel consumption data for POC and PM10 as specified in parts 52 and 53. The owner/operator of S-4473 and S-4474 shall determine SO2 emissions as specified in part 99 in order to demonstrate compliance with both parts 42 and 98. [Basis: BACT]

51) The Owner/Operator of S-4473 and/or S-4474 shall abate at all times of operation S-4473 and/or S-4474 by the properly maintained and operated A-0074 SCR Unit when the catalyst bed is equal to or greater than 550 degrees F. The owner/operator shall maintain the catalyst bed above 500 degrees at all times of operation of S-4473 and S-4474, except during startup or shutdown, or the first 300 hours of operation during the Commissioning Period of S-4473 or S-4474 as specified in part 46. The owner/operator shall not exceed the following ammonia emissions (ammonia slip) concentration

except during periods of startup, shutdown, and commissioning: 10 ppmv of ammonia, dry, corrected to 15% oxygen, as verified by District approved source test method, not to exceed three hours averaging time.
[Basis: Toxics]

a) The owner/operator of S-4473 and S-4474 shall not inject ammonia into the SCR unit (A-0074) until the catalyst bed reaches 500 degrees Fahrenheit. During startup, the owner/operator shall start injecting ammonia as soon as practicable, but under no circumstances later than the lesser of either: 30 minutes from when the catalyst bed reaches 500 degrees Fahrenheit or the catalyst bed reaching a temperature of 562 degrees F. During shutdown, the owner/operator shall stop injecting ammonia as soon as practicable, but under no circumstances later than either 10 minutes from when the catalyst bed reaches 562 degrees Fahrenheit or when the catalyst bed reaches 500 degrees Fahrenheit. The Owner/Operator shall maintain records that demonstrate the temperature during all times of operation of S-4473 and S-4474 and the times that the ammonia injection to the SCR unit (A-0074) begins and ends.

52) No later than 120 days from the date of initial startup of the S-4473 gas turbine and S-4474 duct burner, the Owner/Operator shall conduct a District-approved source test to determine initial compliance with the limits in parts 42, 49 and 51 for SO2, POC, PM10, Sulfuric Acid Mist, and ammonia slip. The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of 109 to 117. The Owner/Operator shall submit the source test results to the District staff no later than 60 days from the date of the source test.
[Basis: Cumulative Increase, Offsets]

53) The Owner/Operator S-4473 gas turbine and S-4474 duct burner shall follow either (a) or (b) below to demonstrate subsequent compliance with the Sulfuric Acid Mist, POC and PM10 mass emission rates specified in parts 42, 49 and the ammonia slip limit in part 51:

a) The Owner/Operator of S-4473 and S-4474 shall properly install, calibrate, and

maintain a District approved continuous emission monitor and recorder for ammonia slip to demonstrate subsequent compliance with the ammonia slip limit in part 51. The Owner/Operator shall conduct one reference test or use the test results from part 52 to demonstrate accuracy of the ammonia slip continuous emission monitor. The Owner/Operator shall conduct three quarterly District approved source tests, followed by two semi-annual District approved source tests to demonstrate subsequent compliance with the Sulfuric Acid Mist, POC and PM10 mass emission rates specified in parts 42, 49, and 51 and the ammonia slip limit in part 51, and one District-approved source test in each subsequent calendar year to demonstrate subsequent compliance with the Sulfuric Acid Mist, POC and PM10 mass emission rates specified in parts 42, 49, and 51. The owner/operator of S-4473 and S-4474 shall conduct the calendar year emissions source tests at least 9 months apart. The owner/operator may be required to conduct more frequent source tests if source test results indicate POC and/or PM10 emissions are within 90% of a limit or exceeding the limit specified in parts 42, 49 and/or 51. The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of 109 to 117. The Owner/Operator shall submit the source test results to the District staff no later than 60 days from the date of the source test; or

b) After the initial source test, the Owner/Operator shall conduct three quarterly District approved source tests, followed by two semi-annual District approved source tests to demonstrate subsequent compliance with the Sulfuric Acid Mist, POC and PM10 mass emission rates specified in parts 42, 49, and 51 and the ammonia slip limit in part 51. After the additional source tests specified in this part 53.b. have been completed, the Owner/Operator shall conduct one District-approved source test in each subsequent calendar year. The owner/operator may be required by the APCO to conduct more frequent source tests if source test results indicate Sulfuric Acid Mist, POC, PM10 and/or ammonia slip

emissions are within 90% of a limit or exceeding the limit specified in parts 42, 49 and/or 51. The owner/operator of S-4473 and S-4474 shall conduct the calendar year emissions source tests at least 9 months apart. The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of 109 to 117. The Owner/Operator shall submit the source test results to the District staff no later than 60 days from the date of the source test.
[Basis: Cumulative Increase, Periodic Monitoring]

54) The Owner/Operator of S-4473 and S-4474 shall not exceed the following emission limits:
[Basis: Rule 2-5]

Nickel	2090 lb/yr
Cadmium	55.7 lb/yr
Sulfuric Acid Mist	30,172 lb/yr

55) The Owner/Operator of S-4473 and S-4474 shall conduct District approved source tests in accordance with all applicable parts of 109 through 117 in order to demonstrate compliance with the limits in part 54. The owner/operator may be required by the APCO to conduct more frequent source tests if source test results indicate emissions are within 90% of any part 54 emissions limit or exceeds any part 54 emissions limit.
[Basis: Rule 2-5, Source Tests]

CONTINUOUS CATALYST REGENERATION REFORMER (CCRR)
S-4452, 4477, 4478, 4479, 4480

56) The Owner/Operator of S-4452 CCRR shall not exceed the following throughput limits:
[Basis: Cumulative Increase]

25,075.5 kbbl fresh feed, any consecutive 12-month period; and 71.3 kbbl fresh feed, maximum per calendar day

57) The Owner/Operator of the S-4452 CCRR vent shall not exceed the following emission limits in any consecutive 12-month period:
[Basis: Cumulative Increase, Offsets]

Pollutant	Annual (tons/yr)
NOx	0.96
CO	6.98
SO2	1.00

PM10 0.23
POC 0.98

The Owner/Operator shall demonstrate compliance with this part 57 using the higher of either: the following concentration limits listed below or the concentration measured by District-approved source test, and flow rate as determined by a District-approved flow meter or calculated from a District-approved method based on one or more of the following: catalyst circulation rate; carbon on spent catalyst; vent gas molecular weight; burn zone inlet O2 concentration; or nitrogen make-up to regeneration loop.

NOx 42 ppmv, dry, corrected to 1% oxygen, averaged over any District-approved compliance source test
CO 500 ppmv, dry, corrected to 1% oxygen, averaged over any District-approved compliance source test
SO2 31 ppmv, dry, corrected to 1% oxygen, averaged over any District-approved compliance source test
PM10 0.0083 grains/DSCF, averaged over any District-approved compliance source test
POC (as methane) 123 ppmv, dry, corrected to 1% oxygen, averaged over any District-approved compliance source test

The Owner/Operator of the S-4452 CCRR vent shall not exceed the following flow rate limits:

44,045 scf/hour, averaged over any consecutive 12-month period, corrected to 1% oxygen; and 79,835 scf/hour, averaged over any calendar day,corrected to 1% oxygen

In order to demonstrate compliance with this condition, the owner/operator shall maintain in a District-approved log a daily emissions estimate including a District-approved flowrate calculation, and monthly and annual totals. [Basis: Cumulative Increase, Offsets]

58) The Owner/Operator of the S-4452 CCRR shall conduct a District-approved source test within 120 days of the date of initial startup to determine initial compliance with the limits in

part 57 for NOx, CO, POC, PM10, and SO2, and to verify the accuracy of the flowrate calculated or measured in part 57. The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of 109 to 117. The Owner/Operator shall submit the source test results to the District staff no later than 60 days from the date of the source test.
[Basis: Cumulative Increase, Offsets]

59) After the initial source test specified in part 58 has been completed, the Owner/Operator of S-4452 CCRR shall conduct three quarterly District approved source tests, followed by two semi-annual District approved source tests to demonstrate subsequent compliance with the mass emission rates, concentration limits, and flowrate measurements specified in part 57. After the additional source tests specified in this part 59 have been completed, the Owner/Operator shall conduct one District-approved source test in each subsequent calendar year. The owner/operator shall conduct the calendar year emissions source tests at least 9 months apart. The owner/operator may be required by the APCO to conduct more frequent source tests if the source test results are within 90% of any emissions or concentration limits or exceeds any emissions or concentration limit specified in part 57. The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of part 109 to 117. The Owner/Operator shall submit the source test results to the District staff no later than 60 days from the date of the source test.
[Basis: Periodic Monitoring, cumulative increase, offsets]

60) The Owner/Operator of CCRR Furnaces S-4477, S-4478, S-4479, and S-4480 shall only fire these units on natural gas (including medium BTU natural gas) and/or refinery fuel gas.
[Basis: BACT, Regulation 2-5, cumulative increase]

61) The Owner/Operator of CCRR Furnaces S-4477, S-4478, S-4478, and S-4480 shall abate the CCRR Furnaces (S-4477, S-4478, S-4479, S-4480) at all times of operation except for startup, shutdown, and CCRR commissioning by the properly operated and properly maintained SCR unit A- 0309.
[Basis: BACT]

62) The Owner/Operator of S-4477, S-4478, S-4479, and S-4480 shall not exceed the following combined emission limits for all four furnaces, in any consecutive 12 month period:
[Basis: Cumulative Increase, Offsets]

Pollutant unless otherwise specified	Annual (tons/yr)
NOx	13.29
CO	16.20 (See part 105)
SO2	11.65 (See Parts 98 and 99)
PM10	16.32
POC	11.81
Sulfuric Acid Mist	1784 lb/yr, 2.6 lb/hr

63) The Owner/Operator of S-4477, S-4478, S-4479, and S-4480 shall demonstrate compliance with part 62 using a District-approved CEMs Systems for NOx, CO, and O2 and District-approved using fuel consumption and the District approved emission factors verified through district approved source tests for PM10 and POC stated in parts 71 and 72. The owner/operator of S-4477, S-4478, S-4479, and S-4480 shall calculate SO2 emissions using fuel usage and fuel sulfur content assuming 100% conversion of total sulfur to SO2.
[Basis: BACT]

64) The Owner/Operator shall properly install, calibrate, maintain, and operate a District-approved continuous emission monitor and recorder for NOx, CO and O2 at the emission point (P-0309) of furnaces S-4477, S-4478, S-4479, and S-4480.
[Basis: Regulation 1-523 BACT, cumulative increase, offsets]

65) The Owner/Operator of S-4477, S-4478, S-4479, and S-4480 shall install a District-approved continuous fuel flow monitor and recorder on each unit in order to determine fuel consumption.
[Basis: Cumulative Increase Offsets]

66) The Owner/Operator of S-4477, S-4478, S-4479, and S-4480 shall not exceed a combined total of 4,380,000 MMBtu per any consecutive 12-month period. The Owner/Operator of S-4477, S-4478, S-4479, and S-4480 shall not exceed the following heat input limits for each furnace:

S-4477 - 201 million BTUs (HHV)/hr averaged over any calendar day.

S-4478 - 402 million BTUs (HHV)/hr averaged over any calendar day.

S-4479 - 201 million BTUs (HHV)/hr averaged over any calendar day.

S-4480 - 201 million BTUs (HHV)/hr averaged over any calendar day.

[Basis: Cumulative Increase, Offsets]

67) This part defines startup, shutdown, and commissioning period for the CCRR unit and furnaces (S-4452, S-4477, S-4478, S-4479, S-4480).

a) The following definitions apply for the startup, shutdown, and CCRR commissioning of S-4452, S-4477, S-4478, S-4479, and S-4480:

i) "Startup" is that period of time not to exceed the lesser of either: (1) twenty-four (24) hours during which a unit is brought up to its normal operating temperature from a cold start, initially at zero fuel flow, by following a prescribed series of separate steps, or (2) operations until it achieves compliance with the NOx and CO emission concentration limits of part 68.

ii) "Shutdown" is that period of time, not to exceed the lesser of either: (1) nine (9) hours during which a unit is taken out of service from a normal operating mode to an inactive status following a prescribed series of separate steps, or (2) operations, commencing with the first of the shutdown prescribed series of separate steps per manufacturer's specifications and ending with the termination of fuel flow to the unit.

iii) "Refractory dryout" shall mean an event that occurs whenever new furnace refractory has been installed. When this new refractory is heated for the first time, the furnace is brought gradually to operating temperature through a series of prescribed steps designed to ensure safe operation of the furnace. The

owner/operator shall maintain records in a District-approved log documenting that refractory has been installed and the date of installation.

iv) "Unit warm up" shall mean an event that occurs whenever startup is commencing when the reactor inlet temperature is below 700 degrees Fahrenheit.

v) "Catalyst dryout" shall mean an event that occurs following a shutdown of the S-4452 reactor where the S-4452 reactor has been opened to the atmosphere. Following the "unit warm-up" step, catalyst dryout gradually increases system temperature through a series of prescribed steps designed to remove excess water from the catalyst to ensure safe operation of the S-4452 reactor prior to reaching operating temperature.

vi) "CCRR commissioning" is a one-time occurrence for each CCRR furnace that shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed for that furnace.

b) The Owner/Operator of S-4477, S-4478, S-4479, or S-4480 shall not exceed 24 consecutive hours for startup. Additional time shall be allotted for each of the circumstances listed in parts 67b(i), (ii), or (iii). The Owner/Operator of S-4477, S-4478, S-4479, or S-4480 shall not exceed any of the time allowances specified in part 67b unless the Owner/Operator has received approval from the District for an extended period. During this startup period, the Owner/Operator shall operate the SCR and ammonia injection in accordance with Part 70.

i) For refractory dryout, the Owner/Operator of S-4477, S-4478, S-4479, or S-4480 shall not exceed an additional 24 consecutive hours.

ii) For unit warm up, the Owner/Operator of S-4477, S-4478, S-4479, or S-4480 shall not exceed an additional 24 consecutive hours.

iii) For catalyst dryout, the Owner/Operator of S-4477, S-4478, S-4479, or S-4480 shall not

exceed an additional 48 consecutive hours.

c) CCRR Commissioning includes startup (not to exceed 24 consecutive hours) plus all three circumstances of parts 67b(i), (ii), and (iii). The Owner/Operator of S-4477, S-4478, S-4479, or S-4480 shall not exceed the sum of these components during CCRR Commissioning, or a total of 120 consecutive hours.

d) The Owner/Operator of S-4477, S-4478, S-4479, or S-4480 shall not exceed 9 consecutive hours for any shutdown.
[Basis: Cumulative Increase, Offsets, Rule 9-10- 218]

68) The Owner/Operator of S-4477, S-4478, S-4479 and S-4480 shall not exceed the following emission limits except during the Commissioning Period and periods of startup and shutdown and/or dryout/warmup periods unless specifically noted below:

NOx emissions - 5.0 ppmv, dry, corrected to 3% oxygen, averaged over any consecutive 3-hour period. Note: This NOx emissions limit applies at times of operation of A-309 as required in Part 70 of these conditions, when the catalyst bed is equal to or greater than 562 degrees F. [Basis: BACT];

CO emissions - 10.0 ppmv, dry, corrected to 3% oxygen, averaged over any consecutive 3-hour period [Basis: BACT];

SO2 emissions - 11.65 tpy (see Part 62) [Basis: Cumulative Increase, 2-2-303, BACT]

PM10 emissions - 0.00745 lb/MMBtu averaged over any consecutive 3-hour period as determined using District-approved source test method. [Basis: Offsets, Cumulative Increase];

POC emissions - 0.00539 lb/MMBtu averaged over any consecutive 3-hour period as determined using District-approved source test method. [Basis: Offsets, Cumulative Increase]

69) The Owner/Operator shall monitor compliance with part 68 by using District-approved CEM Systems for NOx, CO, and O2 and District approved emission factors in part 68 verified through District approved source tests and District-approved fuel consumption data for PM10

and POC. The owner/operator of S-4477, S-4478, S-4479, and S-4480 shall calculate SO2 emissions using District-approved fuel usage and District-approved fuel sulfur content assuming 100% conversion of total sulfur to SO2.
[Basis: BACT]

70) The Owner/Operator of A-0309 shall operate A-0309 at all times of operation of S-4477, S-4478, S-4479 and/or S-4480 operation when the catalyst bed is equal to or greater than 562 degrees F The owner/operator shall not exceed the following ammonia concentration limit except during periods of startup unless otherwise specified in Part 67, shutdown, and commissioning: 10.0 ppmv of ammonia, dry, corrected to 3% oxygen, as verified by District approved source test method, not to exceed three hours averaging time.
[Basis: BACT, cumulative increase, Rule 2-5]

a) The Owner/Operator shall not inject Ammonia into the SCR unit (A-0309) until the catalyst bed reaches 500 degrees Fahrenheit. During startup, the owner/operator shall start injecting ammonia as soon as practicable, but under no circumstances later than the lesser of either: 30 minutes from when the catalyst bed reaches 500 degrees Fahrenheit or the catalyst bed reaching a temperature of 562 degrees F. During shutdown, the owner/operator shall stop injecting ammonia as soon as practicable, but under no circumstances later than either 10 minutes from when the catalyst bed reaches 562 degrees Fahrenheit or when the catalyst bed reaches 500 degrees Fahrenheit. The Owner/Operator shall maintain records that demonstrate the temperature during all times of operation of S-4477, S-4478, S-4479 and S-4480 and the times that the ammonia injection to the SCR unit (A-0309) begins and ends.

71) The Owner/Operator of furnaces S-4477, S-4478, S-4479, and S-4480 shall conduct a District-approved source test within 120 days of the date of initial startup to determine compliance with the limits in parts 62, 68 and 70 for SO2, POC, PM10, Sulfuric Acid Mist, and ammonia slip. The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of 109 to 117. The Owner/Operator shall submit the source test

results to the District staff no later than 60 days from the date of the source test. [Basis: Cumulative Increase, Offsets, BACT]

72) The Owner/Operator of sources S-4477, S-4478, S-4479, and S-4480 shall follow either (a) or (b) below to demonstrate subsequent compliance with the POC and PM10 District approved emission factors in parts 62, 68 and the ammonia slip limit in part 70:

a) The Owner/Operator shall install, calibrate, and maintain a District approved continuous emission monitor and recorder for ammonia slip to demonstrate subsequent compliance with the ammonia slip limit in part 70. The Owner/Operator shall conduct one reference source test or use the source test results from part 71 to demonstrate accuracy of the continuous emission monitor. After the initial source test specified in part 71 has been completed, the Owner/Operator shall conduct three quarterly District approved source tests, followed by two semi-annual District approved source tests to demonstrate subsequent compliance with the POC and PM10 District approved emission factors specified in part 68 and the ammonia slip limit in part 70. After the additional source tests specified in this part 72.a. have been completed, the Owner/Operator shall conduct one District-approved source test in each subsequent calendar year to demonstrate subsequent compliance with the POC and PM10 District approved emission factors specified in part 68. The owner/operator may be required by the APCO to conduct more frequent source tests if source test results indicate emissions are within 90% or exceeds any emissions or concentrations limit specified in parts 62, 68, and 70 or any emissions limit associated with any of these sources. The owner/operator shall conduct the calendar year emissions source tests at least 9 months apart. The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of 109 to 117. The Owner/Operator shall submit the source test results to the District staff no later than 60 days from the date of the source test.; or

b) After the initial source test specified in part 71 has been completed, the Owner/Operator shall conduct three quarterly District approved source tests, followed by two semi-annual District approved source tests to demonstrate subsequent compliance with the POC and PM10 District approved emission factors specified in part 68 and the ammonia slip limit in part 70. After the additional source tests specified in this part 72.b. have been completed, the Owner/Operator shall conduct one District-approved source test in each subsequent calendar year. The owner/operator may be required by the APCO to conduct more frequent source tests if source test results indicate emissions are within 90% or exceeds any emissions or concentrations limit specified in parts 62, 68, and 70 or any emissions limit associated with any of these sources. The owner/operator shall conduct the calendar year emissions source tests at least 9 months apart. The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of 109 to 117. The Owner/Operator shall submit the source test results to the District staff no later than 60 days from the date of the source test. [Basis: Periodic Monitoring]

73) The Owner/Operator of the S-4452 CCRR shall not exceed the following emission limits: [Basis: Toxics, 2-5]

S-4452 CCRR

Benzene	378 lb/yr (fugitive)
Chlorine (vent)	1,420 lb/yr
HCl (vent)	9,880 lb/yr
Dioxins/furans (vent)	4.82E-05 lb/yr

74) Deleted.

75) Except for the part 73 fugitive benzene emissions, the Owner/Operator of S-4452, S-4477, S-4478, S-4479 and S-4480 shall conduct District approved source tests in accordance with the applicable parts of 109 through 117 and to demonstrate compliance with the limits in part 73. The owner/operator may be required by the APCO to conduct more frequent source tests if source test results indicate emissions are

within 90% or exceeds any emissions or concentrations limit specified in part 73 of any emissions limit associated with any of these sources. The owner/operator shall conduct the calendar year emissions source tests at least 9 months apart.
[Basis: Rule 2-5, Source Tests, Cumulative Increase]

76) The Owner/Operator of S-4452 shall determine compliance with the part 73 benzene fugitives by using the maximum weight percent benzene in the S-4452 streams multiplied by the total corresponding POC emissions estimate for those streams as determined using Parts 1, 2, 3, and 4. The owner/operator shall maintain records in a District-approved log of the benzene concentrations within the streams used for this calculation and the corresponding POC emissions estimates from each stream. The records shall be retained for five years from date of entry and shall be made available to District staff upon request.
[Basis: Toxics 2-5, NSPS Subpart VVV]

HYDROGEN PURITY IMPROVEMENTS

77) The Owner/Operator of S-4454 No. 6 H2S Plant (Recycle Amine Regenerator) shall not exceed the following limits:
[Basis: Cumulative Increase]

3358 MMSCF H2S produced, any consecutive 12-month period
11 MMSCF H2S produced, maximum per calendar day

78) The Owner/Operator of Sulfur Loading Rack S-4490 shall abate this source by a properly maintained and properly operated A-0310 Sulfur Loading Rack Caustic Scrubber at all times of operation of S-4490. The Owner/Operator of A-310 shall abate only S-4490 with A-310.
[Basis: Cumulative Increase, Rule 2-5]

a) The Owner/Operator of S-4490 shall install and maintain a safety interlock that prevents the operation of S-4490 without the A-310 scrubber properly operating in order to demonstrate compliance with Part 78.

79) The Owner/Operator of S-4490 Sulfur Loading Rack shall not exceed any of the following limits:

328,500 long tons during any consecutive 12-month period
900 long tons per calendar day.
[Basis: Cumulative Increase]

80) The Owner/Operator of S-4253 TKC/FCC Feed Hydrotreater shall not exceed the following throughput limitations:
[Basis: Cumulative Increase]

29,200 kbbl feed material, over any consecutive 12-month period
96,000 bbl feed material, calendar day

Sulfur Recovery Units S-4227 through S-4229:

81) The Owner/Operator of A-0020, A-0021 and A-0022 Tail Gas Units abating the S-4227, S-4228, and S-4229 Claus Plants (SRUs), respectively, shall each maintain a minimum oxidization temperature of 1400 degrees Fahrenheit.
[Basis: BACT]

The owner/operator shall comply with the temperature limit of 1400F in Part 81 at all times, except during an "Allowable Temperature Excursion" as specified below, provided that the temperature controller setpoint remains at a minimum of 1400 degrees Fahrenheit. An Allowable Temperature Excursion is one of the following:

a. A temperature excursion not exceeding 20 degrees F; or
b. A temperature excursion for a period or periods which when combined are less than or equal to 15 minutes in any hour; or
c. A temperature excursion for a period or periods which when combined is more than 15 minutes in any hour, provided that all three of the following criteria are met.

i. the excursion does not exceed 50 degrees F;
ii. the duration of the excursion does not exceed 24 hours; and
iii. the total number of such excursions does not exceed 12 per calendar year (or any consecutive 12 month period).

Two or more excursions greater than 15 minutes in duration occurring during the same 24-hour period shall be counted as one excursion toward

the 12-excursion limit. (basis: Regulation 2-1-403)

For each Temperature Excursion below 1400 degrees Fahrenheit, the owner/operator shall keep all records to the satisfaction of the APCO in order to demonstrate compliance with the qualifying criteria described above. Records shall be retained for a minimum of five years from the date of entry, and shall be made available to the District upon request. Records shall include at least the following information:

a. Temperature controller setpoint;
b. Starting date and time, and duration of each Allowable Temperature Excursion;
c. Measured temperature during each Allowable Temperature Excursion;
d. Number of both Temperature Excursions and Allowable Temperature Excursions per month, and total number for the current consecutive 12-month period; and
e. All strip charts or other temperature records.
(Basis: Regulation 2-1-403)

82) The owner/operator of S-4227, 4228 and 4229 shall abate each at all times of operation of S-4227, S-4228, and S-4229 by the properly maintained and properly operated A-20, A-21, and A-22 tail gas units, respectively. The owner/operator shall also install and maintain an acid gas scrubber (A-4450) to prevent the release of acid gas during an unscheduled loss of SRU capacity. The owner/operator of S-4227, 4228, and 4229 shall not exceed a combined acid gas feed rate to the three SRUs of 24.5 MMscf/day averaged over any consecutive 3-hour period plus an additional 3 MMscf/day from sour water sources, which can be shut down immediately. Prior to exceeding the emergency scrubber capacity of A-4450 and/or A-4451, the owner/operator shall shut down refinery acid gas generating sources including the 3 MMscf/day from sour water sources, and cease acid gas generation at the refinery to reduce the acid gas feed rate below the capacity of the two remaining SRUs ("Load Shed Procedures").
(Basis: BACT)

83) The owner/operator of S-4227, S-4228, and S-4229 shall abate each by the properly installed,

properly maintained, and properly operated A-120, A-121, and A-122 Wet Electrostatic Precipitators (Wet ESPs), respectively, at all times of operation of S-4227, S-4228, and/or S-4229.
[Basis: BACT, Rule 2-5].

84) The Owner/Operator of S-4227, S-4228, and S-4229 shall not exceed the following limits at the emission point of each A-0020, A-0021, and A-0022 except during periods of startup, shutdown, and refractory dryout as defined below, as demonstrated by a District-approved source test method, CEM, or other District-approved method:

a) NOx emissions of 50.0 ppm, dry, corrected to 0% O2, 3-hour average
b) SO2 emissions of 50.0 ppm, dry, corrected to 0% oxygen, averaged over any calendar day
c) H2S emissions of 4.0 ppm, dry, corrected to 0% O2, averaging time based on district approved source test method
d) PM10 emissions: short-term limit as specified in part 88.
e) Sulfuric Acid Mist emissions: See part 95
f) 15,000 dscfm, corrected to 0% O2, exhaust flow rate averaged over any 1 hour period at each S-4227 and S-4228.
g) 30,000 dscfm, corrected to 0% O2, exhaust flow rate averaged over any 1 hour period at S-4229.

For the purposes of complying with this part, the following definitions and limits apply for the startup, shutdown, and refractory dryout periods of S-4227, S-4228, and/or S-4229:

"Startup" begins with startup of the main air blower and ends when operation is stable and the Air-to-H2S ratio controller is placed in the automatic control mode.

"Refractory dryout" shall mean an event that occurs whenever new refractory has been installed. When this new refractory is heated for the first time, the unit is brought gradually to operating temperature through a prescribed series of steps designed to ensure safe operation.

The owner/operator of S-4227, S-4228, or S-4229 shall not exceed 12 consecutive hours for startup or 24 hours for startups involving refractory dryout.

"Shutdown" begins after acid gas feed has been replaced with natural gas purge and, following the sequence to remove residual sulfur compounds from the unit, the Main Reaction Furnace firing rate is reduced while increasing excess O2 to check for residual reactions. The shutdown period ends when the main air blower is shut down.

The owner/operator of S-4227, S-4228, or S-4229 shall not exceed 9 consecutive hours for any shutdown.
[Basis: BACT, cumulative increase, Rule 2-5]

85) The Owner/Operator of S-4227, S-4228, and S-4229 shall comply with parts 84, 86, 87, 90, and 92. These conditions supersede Condition 19063, after modification of each SRU S-4227, S-4228, and S-4229, respectively.
[Basis: BACT, Rule 2-5, Cumulative Increase]

86) The Owner/Operator of S-4227, S-4228, and S-4229 Sulfur Recovery Units (SRUs) shall perform all of the following:

a. In order to reduce H2S bypassing at the thermal oxidizers, the owner/operator shall modify each SRU's thermal oxidizer internals for better mixing,improve the control of excess oxygen, and relocate the sulfur pit vent line to the tail gas inlet line unless studies required below demonstrates that there is no beneficial effect.
Within 60 days of the issuance of the Authority to Construct for this project, the owner/operator shall both conduct and submit studies in order to indicate whether the relocation of the sulfur pit vent line to the tail gas inlet line would have any beneficial effect, subject to District approval.
If the study demonstrates to the satisfaction of the District that there is a beneficial effect, then the owner/operator shall relocate the sulfur pit vent line to the tail gas inlet line. Within 60 days of the issuance of the Authority to Construct for this project, the owner/operator shall submit the thermal oxidizer engineering design drawings or other equivalent drawings, and a written explanation of all design features that demonstrate that the thermal oxidizer internals will improve mixing and detailed description of measures taken to improve the control of excess oxygen.
b. The owner/operator shall install ultra low-NOx burners equipped with fuel induced

recirculation (FIR) on each thermal oxidizer of each SRU. Within 30 days of an ultra low-NOx burner vendor or design selection, the owner/operator shall submit for District approval the design drawings and explain the design features that will result in the NOx reductions.

c. The owner/operator shall install ultra low-NOx burners equipped with FIR on each stack gas heater of each SRU. Stack gas source numbers are S-4436, S-4437, and S-4438. Within 30 days of an ultra low-NOx burner vendor or design selection, the owner/operator shall submit for District approval the design drawings and explain the design features that will result in the NOx reductions.

d. The owner/operator shall not exceed the following maximum firing rates:
(Basis: Increase)

No. 1 SRU Stack Gas Heater S-4436 765.60 MMBTU/day HHV
No. 2 SRU Stack Gas Heater S-4437 765.60 MMBTU/day HHV
No. 3 SRU Stack Gas Heater S-4438 1,346.0 MMBTU/day HHV
No. 1 SRU Thermal Oxidizer burner S-4227/A-20 739.0 MMBTU/day HHV
No. 2 SRU Thermal Oxidizer burner S-4228/A-21 739.0 MMBTU/day HHV
No. 3 SRU Thermal Oxidizer burner S-4229/A-22 1,080.0 MMBTU/day HHV

e. The owner/operator shall perform District-approved computational fluid dynamic analysis (flow modeling) of the thermal oxidizers to assist in optimizing the performance. The results shall be submitted to the District for review and approval.

f. The owner/operator shall improve the scrubbing of SO2 by the SRU SO2 Absorbers by increasing the makeup sodium sulfite rate, and upgrading the piping and controls to meet the SO2 concentration limit in Part 84c. The controls for caustic makeup will also be upgraded for more stable operation. Within 60 days of the issuance of the Authority to Construct for this project, the owner/operator shall submit for District review and approval the pre-project and post-project engineering design drawings or other equivalent drawings that demonstrate, which may include the following to meet the SO2 concentration limit in Part 84c:

1. the makeup sodium sulfite rate for each SRU to improve the scrubbing of SO2 by the SO2 Absorbers,

2.the piping and control upgrades, and
3.the caustic makeup control upgrades.

g. On S-4454 #6 H2S Recovery Unit, the owner/operator shall install carbon filtration of the amine, optimize sizing and internal design of the amine flash drum, and follow Best Practice design guidelines for hydrocarbon removal including District-approved monitoring and carbon change-out procedures.

h. Within 60 days of the issuance of the Authority to Construct for this project, the owner/operator shall complete design development and submit the design for District review in order to identify whether an alternative design will achieve or accomplish the same objective to the satisfaction of the District, which is to reduce C3 and C4 carryover into the vent gas and acid gas by adding/upgrading coolers in at least three locations.

i. The owner/operator shall reroute the PSA tail gas, which currently goes to the RLOP Gas Recovery Unit to the Hydrogen Plant (S-4449 through S-4450) feed or to the refinery fuel gas system in order to reduce the GRU feedrate and improve cooling and separation at the RLOP GRU.

j. The owner/operator of S-4227, S-4228, and S-4229 shall properly install and properly operate a Medium Oxygen Enrichment System (up to 50%) in order to comply with parts 84, 87, 90, and 92. (Basis for parts a through j, not including d: Cumulative Increase, BACT)

87) The Owner/Operator of S-4227, S-4228, and S-4229 shall abate the S-4227, S-4228, and S-4229 SRUs at all times of operation by the properly installed, properly maintained, and properly operated A-20, A-21, and A-22 Tail Gas Units, respectively, and the properly installed, properly maintained, and properly operated A-120, A-121, A-122 Wet Electrostatic Precipitators (Wet ESPs), respectively. The owner/operator of each SRU S-4227 through S-4229 shall not exceed the following total sulfur production levels [Basis: cumulative increase, offsets, Rule 2-5]:
   a) S-4227 abated by A-20 and A-120:

      i) The lesser of either: 345 Long Tons in any calendar day, or the throughput level

determined through District-approved source testing to be maximum calendar day throughput achievable while complying with all emissions limitations. Annual throughput values will be determined either through District-approved source testing and/or the use of the District-approved CEMs and District-approved flowmeters in order to determine the maximum annual throughput that corresponds to compliance with all annual emissions limits.

b) S-4228 abated by A-21 and A-121:

i) The lesser of either: 345 Long Tons in any calendar day or the throughput level determined through District-approved source testing to be maximum calendar day throughput achievable while complying with all emissions limitations. Annual throughput values will be determined either through District-approved source testing and/or the use of the District-approved CEMs and District-approved flowmeters in order to determine the maximum annual throughput that corresponds to compliance with all annual emissions limits.

c) S-4229 abated by A-22 and A-122:

i) The lesser of either: 570 Long Tons in any calendar day, or the throughput level determined through District-approved source testing to be maximum calendar day throughput achievable while complying with all emissions limitations. Annual throughput values will be determined either through District-approved source testing and/or the use of the District-approved CEMs and District-approved flowmeters in order to determine the maximum annual throughput that corresponds to compliance with all annual emissions limits.

d) The total combined calendar day throughput from S-4227, S-4228, and S-4229 combined shall not exceed 900 Long Tons in any calendar day.

e) The owner/operator of S-4227, S-4228, and S-4229 may exceed the throughput levels established through District-approved source testing per Parts 87a, b, and/or c and the next paragraph, upon receipt of written

approval by the APCO of a source test plan for demonstrating compliance with all concentration and mass limits at a higher throughput level. During the source test, the throughput level may not exceed the maximum level stated in Parts 87a, b, and/or c and all emissions measured by CEMs shall remain in compliance with the permitted concentration and/or permitted mass levels to be averaged over the source test. Exceedance of emission levels determined by source testing that occur during the source test shall not be considered a violation as long as Chevron follows the source test plan pre-approved by the APCO. Until January 1, 2012, the owner/operator may conduct source tests, pursuant to this part, to establish the throughput levels not to exceed the maximum throughput levels specified in Part 87 for each SRU. During this time period, consistent with both Regulation 2-1-234 and Regulation 2-5-214, an increase in throughput up to the maximum throughput levels as specified in Part 87 shall not be considered a modification for purposes of Regulation 2 provided that there is no increase in any permitted emission levels from these SRUs. For the purposes of Regulation 2, Rule 6, changes made as a result of this part shall be considered either Minor or Administrative as determined by the APCO.

The owner/operator of S-4227, S-4228, and S-4229 shall conduct a district pre-approved source test within 120 days of modification of each unit, on each unit operating at maximum throughput levels listed above in order to demonstrate compliance with all emissions limits (NOx, CO, SO2, PM10, POC, H2S, and H2SO4) at maximum throughput levels. The 120-day deadline for this testing may be extended upon written approval of the APCO. The source test shall also note all operating parameters determined by the District as part of the source test pre-approval, which may become enforceable permit conditions if the district determines that the parameters are required in order to comply with all emissions limits. The throughput levels above may be adjusted based on the District-approved results of the District-approved source test. The throughput levels may be subsequently adjusted up to the maximum levels listed in Parts 87a, b, and/or c based on the results of the subsequent source testing through the submittal of a District permit application. The results of these source

tests shall be submitted to the district for approval no later than 60 days from the test date.

The owner/operator of each S-4227, S-4228, and S-4229 shall use oxygen enrichment (up to a maximum of 50% oxygen enrichment) at all times of operation above the following throughput levels of each SRU: S-4227 and S-4228 at 150 long tons per day, and S-4229 at 300 long tons per day. The owner/operator of each SRU may use oxygen enrichment at lower throughput levels.

88) The Owner/Operator of A-120, A-121, and A-122 shall achieve a minimum abatement efficiency of 90% by weight of both PM10 and Sulfuric Acid Mist. The owner/operator shall demonstrate continuous compliance with this abatement efficiency through the use of the following parametric monitoring parameters (Basis: Offsets, cumulative increase):

The owner/operator of A-120, A-121, and A-122 shall not exceed any of the following PM10 and Sulfuric Acid Mist limits as specified in parts 84, 90, 92, and 95 from each Wet ESP (A-120, A-121, and A-122):

The owner/operator of A-120 shall not exceed:

a. PM10 Limit 0.504 lb averaged over one hour as demonstrated using District approved source test method.

The owner/operator of A-121 shall not exceed:

b. PM10 Limit 0.450 lb averaged over one hour as demonstrated using District approved source test method.

The owner/operator of A-122 shall not exceed:

c. PM10 Limit 0.884 lb averaged over one hour as demonstrated using District approved source test method.

The owner/operator of Wet Electrostatic Precipitators (A-120, A-121, and A-122) shall abate at all times of operation of the SRUs (S-4227, S-4228, and S-4229) respectively with the properly maintained, properly operated, fully charged Wet Electrostatic Precipitators (A-120, A-121, and A-122). This shall include the following:

1). Continuously monitor and record the inlet water flow rate (in gallons per minute) to each scrubber and maintain a minimum inlet water flow rate of [TBD] in (gallons per minute).

2). Monitor and record Transformer Rectifier (TR) set secondary current readings on a daily basis.

3). Install a temperature monitor and recorder at the inlet of the Wet ESP. The inlet temperature of each Wet ESP shall be maintained at a maximum of [TBD] degrees F. An alarm shall be set in such a manner to indicate temperature excursions above [90% of TBD] degrees F.

4). The secondary current of any TR set shall not be less than [TBD] milliamps averaged over any three hour period, or the secondary current of up to two TR sets may be less than [TBD] milliamps, averaged over any three hour period, as long as the remaining TR sets maintain an average secondary current above [TBD] milliamps, averaged over any three hour period. An alarm shall be set in such a manner to indicate secondary current excursions below [TBD] milliamps.

The parametric conditions in this part may be re-evaluated or adjusted, if District-approved source test data demonstrate to the satisfaction of the APCO that alternate parametric conditions are necessary for or capable of maintaining compliance with an emission limit of PM10 and/or Sulfuric Acid Mist as determined by District-approved source test methods.

The annual PM10 and Sulfuric Acid Mist emissions rate shall be determined by District approved source test methods. The owner/operator shall hire a third-party source test firm to perform at least four source tests per calendar year to determine the hourly PM10 and Sulfuric Acid Mist emission rates. The results of each quarterly source test shall be used to estimate the emissions for that calendar quarter. The four quarterly mass emissions estimates shall be added together to determine compliance with the annual emissions limits of these permit conditions. Each source test shall be performed in accordance with the District's Manual of Procedures. The owner/operator shall notify the District Source Test Manager and the Engineering Division at least seven (7) days prior to the test, to provide the District staff the option of observing the test. Within 60 days of the test date, the owner/operator shall submit a comprehensive report of the test results to the District's Source Test Manager for review and approval.

The owner/operator of S-4227, S-4228, and S-4229 shall conduct at least one source test every quarter in order to demonstrate compliance with all emissions limits not covered by CEMs. If this source test window partially or completely overlaps a plant shutdown and its 7-day startup period, the owner/operator shall conduct a source test within 14 days of the date of the plant or source startup.

The Owner/Operator Of S-4227, S-4228, and S-4229 shall continue to conduct quarterly source tests for at least two years after the date of issuance of the Permit to Operate for the last Renewal Project source (excluding the Cogen and CCRR Plants). After the quarterly source tests specified above in this part, the Owner/Operator may submit an application for District approval to request to change the frequency to semi-annual or bi-annual provided that all District-approved source test results demonstrate that the emissions are less than 90% of any PM10 or sulfuric acid mist emissions limit.

The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of 109 to 117. The Owner/Operator shall submit the source test results to the District staff no later than 60 days from the source test date. [Basis: Periodic Monitoring, cumulative increase, Regulation 1-523]

In order to demonstrate compliance with this part and part 84, 90, 92, and 95, the owner/operator shall maintain in a District-approved log, updated monthly, all of the following:

1). PM10 and Sulfuric Acid Mist emissions source test results, lb/hour.
2). Daily inlet water flowrate inspection records indicating working condition and repairs.
3). pH of water system
4). Daily ESP Transformer Rectifier (TR) set secondary current readings; and
5). Wet ESP inlet temperature records.

These records shall be retained for at least five years from date of entry and be made available to the BAAQMD upon request.

a)(Placeholder) Install a temperature monitor and recorder at the inlets of each Wet ESP (A-120, A-121, and A-122). The inlet temperature

of each Wet ESP shall be maintained at a maximum of 170 degrees F/TBD degrees Fahrenheit averaged over any one hour period. An alarm shall be set in such a manner as to indicate temperature excursions above 153 F.)

b)(Placeholder) Monitoring and recordkeeping provisions to insure appropriate electric field strength.

c)(Placeholder) Condition(s) to insure proper water flow.

d)(Placeholder) pH of water system.

For each above "placeholder" or "TBD", the owner/operator shall provide the above vendor-supplied information within 60 days of the selection of the vendor.

89) The Owner/Operator of S-4227, S-4228, and S-4229 shall maintain a District-approved daily log with monthly summaries of all sulfur production, acid gas feedrate (in MMSCF/day), maximum hourly flow rate (in scfm), all CEM data, daily H2S data and source test data at each S-4227, S-4228, and S-4229 to demonstrate compliance with parts 82, 84, 90, 92, and 95 and all Wet ESP parametric measurements to demonstrate compliance with parts 84, 90, 92, and 95. This log shall be kept on site for 5 years from the date of entry and be made available to District staff upon request.

90) The Owner/Operator of the S-4227, S-4228, and S-4229 Claus Plants (SRUs), S-4436, S-4437 and S-4438 (stack heaters), A-20, A-21, and A-22 (Tail Gas Units), and A-120, A-121, A-122 (Wet ESP's) shall not exceed the following combined emission limits in any consecutive 12-month period:
[Basis: Cumulative Increase, Offsets]

Pollutant	Annual (tons/yr)
NOx	62.33
CO	113.80
SO2	86.70
PM10	5.34
POC	2.84

H2S 4.0 ppm, dry, corrected to 0% O2, averaging time based on District-approved source test Method

Sulfuric Acid Mist 1.856 lb/hour

The Owner/Operator of the S-4227, S-4228, and S-4229 shall each demonstrate compliance with

parts 84, 90, 92, and 95 using District-approved CEMs Systems for NOx, CO, SO2, O2, and either exhaust gas flow meters (S-4229) or duct flow meters combined with a District approved flow calculation method and using District approved source testing and/or District-approved flow measurement and/or calculation method in order to demonstrate compliance with parts 84, 90, 92, and 95 for PM10, POC, H2S, and Sulfuric Acid Mist.
[Basis: Monitoring]

91) The Owner/Operator of the S-4227, S-4228, and S-4229 Claus Plants (SRUs) and S-4436, S-4437 and S-4438 (stack heaters) shall install, calibrate, maintain, and operate a District-approved continuous emission monitor and recorder at each emission point (P-0151, P-0152, and P-0153) for NOx, CO, SO2, O2, and District-approved exhaust gas flow rate (in scfm).
[Basis: BACT, offsets, Rule 2-5]

a. The Owner/Operator of the S-4227, S-4228, and S-4229 Claus Plants (SRUs) and S-4436, S-4437 and S-4438 (stack heaters) shall conduct District-approved monitoring and recording on a monthly basis at each emission point (P-0151, P-0152, and P-0153) for hydrogen sulfide (H2S) (in ppmv and lb/day) in order to demonstrate compliance with the concentration and mass emission limits specified in parts 84, 90, 92, and 95. If the monthly monitoring window partially or completely overlaps a plant shutdown and its 7-day startup period, the owner/operator shall conduct monitoring within 14 days of the date of the plant or source startup. [Basis: BACT, Rule 2-5]

92) The Owner/Operator of the S-4227, S-4228, and S-4229 Claus Plants (SRUs) and S-4436, S-4437 and S-4438 (stack heaters) shall not exceed the following emission limits at each emission point (P-0151, P-0152, and P-0153) except during startup and shutdown:

The Owner/Operator of the S-4227 Claus Plant (SRU) and S-4436, (stack heater) shall not exceed the following emission limits in any consecutive 12 month period for the tons/year limits, any calendar day for the daily limits and the averaging time as specified for the remaining limits:

Pollutant	(tons/yr)	(lb/day)

NOx	15.38	
CO	28.08	222.72
SO2	21.39	
PM10	1.44	9.8
POC	0.76	9.8
H2S 4.0 ppm averaging time based on District-approved source test method		
Sulfuric Acid Mist	0.673	lb/hour

The Owner/Operator of S-4227 shall not exceed a maximum exhaust gas flowrate of 15,000 dry scfm, corrected to 0% O2, averaged over any one hour period. [Basis: Rule 2-5, BACT]

The Owner/Operator of the S-4228 Claus Plant (SRU) and S-4437, (stack heater) shall not exceed the following emission limits in any consecutive 12 month period for the tons/year limits, any calendar day for the daily limits and the averaging time as specified for the remaining limits:

Pollutant Annual	(tons/yr)	(lb/day)
NOx	15.38	
CO	28.08	173.52
SO2	21.39	
PM10	1.30	9.8
POC	0.76	9.8
H2S 4.0 ppm averaging time based on District-approved source test Method		
Sulfuric Acid Mist	0.425	lb/hour

The Owner/Operator of S-4228 shall not exceed a maximum exhaust gas flowrate of 15,000 dry scfm, corrected to 0% O2, averaged over any one hour period.
[Basis: Rule 2-5, BACT]

The Owner/Operator of the S-4229 Claus Plant (SRU) and S-4438, (stack heater) shall not exceed the following emission limits in any consecutive 12 month period for the tons/year limits, any calendar day for the daily limits and the averaging time as specified for the remaining limits:

Pollutant Annual	(tons/yr)	(lb/day)
NOx	31.57	
CO	57.64	325.44
SO2	43.92	
PM10	2.60	9.8
POC	0.32	9.8
H2S 4.0 ppm averaging time based on District-approved source test Method		
Sulfuric Acid Mist	0.758	lb/hour

The Owner/Operator of S-4229 shall not exceed a maximum exhaust gas flowrate of 30,000 dry scfm, corrected to 0% O2, averaged over any one hour period. [Basis: Rule 2-5, BACT]
[Basis: BACT, Cumulative Increase, Offsets]

93) The Owner/Operator of S-4227, S-4228, and S-4229 shall conduct a District-approved source test within 120 days of the date of initial startup of each unit to determine initial compliance with the limits in parts 84, 90, 92, and 95 for POC, H2S, PM10, Sulfuric Acid Mist, and ammonia and including the District-approved exhaust gas flowrates (measurement or combined measurement and calculation). The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of 109 to 117. The Owner/Operator shall submit the source test results to the District staff no later than 60 days from the date of the source test.
[Basis: Cumulative Increase, Offsets, BACT, Regulation 7]

94) After the initial source test specified in part 93 has been completed, the Owner/Operator of S-4227, S-4228, and S-4229 shall conduct quarterly District approved source tests to demonstrate compliance with the limits in parts 84, 90, 92, and 95 for POC, H2S, PM10, and Sulfuric Acid Mist, and District-approved exhaust gas flowrates (measurement or combined measurement and calculation). The Owner/Operator of S-4227, S-4228, and S-4229 shall continue to conduct quarterly source tests for at least two years after the date of issuance of the Permit to Operate for the last Renewal Project source (excluding the Power Plant Replacement Project). After the quarterly source tests specified above in this part, the Owner/Operator may submit an application for District approval to request to change the frequency to semi-annual source testing. The owner/operator of S-4227, 4228, and 4229 shall conduct the quarterly emissions source tests at least 2 months apart and not more than 4 months apart. The owner/operator may be required by the APCO to conduct more frequent source tests if source test results indicate emissions are within 90% of any emissions limit associated with any of these sources or exceeding any emissions limits associated with any of these sources. The Owner/Operator shall conduct the

District approved source tests in accordance with the applicable parts of 109-to 117. The Owner/Operator shall submit the source test results to the District staff no later than 60 days from the date of the source test.
[Basis: Periodic Monitoring, cumulative increase]

95) The Owner/Operator of S-4227, S-4228, and S-4229 shall not exceed the following emission limits:
[Basis: Toxics]

S-4227 SRU 1
Sulfuric Acid Mist (stack) 0.673 lb/hr
H2S (stack) 0.323 lb/hr

S-4228 SRU 2
Sulfuric Acid Mist (stack) 0.425 lb/hr
H2S (stack) 0.323 lb/hr

S-4229 SRU 3
Sulfuric Acid Mist (stack) 0.758 lb/hr
H2S (stack) 0.646 lb/hr

H2S (fugitive) from Renewal Project components at S-4227, S-4228, and S-4229

H2S (fugitive) 0.0994 lb/hr

96) Deleted.

FUEL GAS SYSTEM

97) The Owner/Operator of the three Fuel Gas Mix Drums V-475, V-870, and V-701 shall install and operate a District-approved continuous gaseous fuel monitors and recorder(s) in order to demonstrate compliance with both the H2S limit and total sulfur limit of the refinery fuel gas at the outlets of each of the three fuel gas mix drums. The Owner/Operator shall calculate and record the following for each fuel gas mix drum of the refinery fuel gas system in order to demonstrate compliance with parts 98 and 99:

a) Each calendar day, the Owner/Operator of the three Refinery Fuel Gas Mix Drums shall record the following for each refinery fuel gas mix drum: daily fuel gas flow as measured by a District-approved fuel gas flowmeter at each drum, daily averaged calendar day H2S content

(in ppmv) of the refinery fuel gas, any consecutive 365 day average of H2S concentration (ppmv), hourly maximum total sulfur content (in ppmv), daily averaged calendar day total sulfur content (in ppmv), any consecutive 365 day average of total sulfur content (in ppmv), and daily averaged HHV heat capacity as Btu/scf;

b) The owner/operator of the three refinery fuel gas mix drums shall calculate using District-approved methodology the total sulfur dioxide emissions in tons per year from the refinery fuel gas system for each calendar day with monthly totals. The owner/operator shall record the sulfur dioxide emissions in a District-approved log for at least five years from the date of entry and shall be made available to District staff upon request. [Basis: BACT, cumulative increase, offsets, Regulations 1-522, 1-523]

98) The Owner/Operator of the three Refinery Fuel Gas Mix Drums shall not exceed the following limits at the outlet of each of the refinery fuel gas mix drums [Basis: BACT, cumulative increase, offsets, Regulations 1-522, 1-523]:

a) 50 ppmv H2S (at each drum), averaged over a calendar day;
b) 18.83 ppmv H2S (flow-weighted average of all three drums), averaged over any consecutive 12 month period;
c) 100 ppmv total sulfur concentration (at each drum), averaged over a calendar day;
d) 200 ppmv total sulfur (at each drum), averaged over any hour;
e) 30.85 ppmv total sulfur concentration (flow-weighted average of all three drums) any consecutive 12-month period.
f) The owner/operator of the three Refinery Fuel Gas Mix Drums and S-4473 and S-4474 Cogeneration and Heat Recovery Steam Generator shall not exceed a combined total of 53.15 tons per year SO2 from all refinery sources fired on refinery fuel gas (as measured at the outlet of each of the three drums using total sulfur in ppmv and District-approved measured fuel flow of each drum assuming 100% conversion of total sulfur to SO2) using a District-approved calculation method and from the Cogeneration Sources (S-4473 and S-4474) natural gas and liquefied petroleum gas (LPG)

assuming 100% conversion of total sulfur to SO2 using a District-approved calculation method.

99) a) The owner/operator shall determine the total sulfur dioxide emissions in tons per year from the S-4473 gas turbine, from the sum of the total sulfur in the natural gas fuel stream and the total sulfur in the LPG stream. The sulfur in the natural gas fuel stream shall be calculated as the concentration of total sulfur in the incoming natural gas supply, as measured daily multiplied by the District-approved measured flow of the natural gas used as fuel assuming 100% total sulfur conversion to SO2 using a District-approved method. The total sulfur in the LPG stream shall be calculated from District-approved flow meter measurements of the LPG going to the S-4473 gas turbine multiplied by the LPG total sulfur content assuming 100% total sulfur conversion to SO2 using a District-approved method.

b) Total sulfur dioxide emissions in tons per year from the S-4474 duct burner, assuming 100% total sulfur conversion to SO2 using a District-approved method. The owner/operator shall calculate the total sulfur in the natural gas fuel stream as the concentration of sulfur in the incoming natural gas supply, as measured daily by District-approved total sulfur monitor, multiplied by the measured fuel flow at S-4474 when fired exclusively on natural gas. When firing on either RFG or a combination of natural gas and RFG, the owner/operator shall use the District-approved measured total sulfur and the District-approved fuel flow assuming 100% total sulfur conversion to SO2 using a District-approved method.

c) The owner/operator shall maintain records in a District-approved daily log of the amount and type of fuel usage (i.e. natural gas, LPG, and refinery fuel gas), total sulfur content of each fuel used, and SO2 emissions estimates in tons per calendar day, per consecutive 365-day totals, and monthly summaries in tons per month. The owner/operator shall retain this log onsite for at least five years from the date of entry and shall be made available upon request to District staff.
[Basis: BACT, cumulative increase, offsets,

Regulations 1-522, 1-523]

For the purposes of compliance with the SO2 bubble or any of its related parts, the owner/operator shall use only District pre-approved methods and calculation procedures.

RENEWAL PROJECT COMMISSIONING PERIOD

100) The owner/operator of all sources of the Renewal Project shall comply with Parts 100 through 108 during the Renewal Project Commissioning Period. The Renewal Project Commissioning Period is defined as the period that begins when the first new or modified Renewal Project source commences operations, and terminates 180 calendar days after the last Renewal Project new or modified source commences operations.
[Basis: Cumulative Increase, PSD]

101) During the Renewal Project Commissioning Period, the Owner/Operator shall only operate the existing steam boilers (S-4129, S-4131, S-4132, S-4133, S-4135) and the new cogeneration plant (S-4473 and S-4474) simultaneously for up to a maximum of 90 days as long as the combined firing rate for all these units remains less than or equal to 860 MMBTU/hr on a calendar day average.
[Basis: Cumulative Increase, Rule 2-2-410, PSD]

102) During the Renewal Project Commissioning Period, the Owner/Operator shall operate the existing #4 Rheiniformer (S-4283), the existing #5 Rheiniformer (S-4237), and the new CCRR and associated furnaces (S-4452, S-4477, S-4478, S-4479, S-4480) simultaneously for up to a maximum of 90 days within a 180 calendar day period as long as the combined feeds to the three reformer units (S-4237, S-4283, and S-4452) remain below 71.3 kbbl per calendar day.
[Basis: Cumulative Increase, Rule 2-2-410, PSD]

103) During the Renewal Project Commissioning Period, the Owner/Operator shall operate the first existing Hydrogen Train to be shut down (either S-4250 Train A or S-4250 Train B), its associated reaction furnace (either S-4170 or S-4171), the first new Hydrogen Plant (Either S-4449 or S-4450), and its associated reaction furnace (S-4471 or S-4472) simultaneously for up to a maximum of 90 days as long as the combined

production rate of all operating hydrogen manufacturing plants remains below 181.1 million standard cubic feet per day.

The Owner/Operator shall operate the other existing Hydrogen Train, its associated reaction furnace, the other new Hydrogen Plant, and its reaction furnace simultaneously for up to a maximum of 90 days as long as the combined production rate of all operating hydrogen manufacturing plants remains below 181.1 million standard cubic feet per day.
[Basis: Cumulative Increase, Rule 2-2-410, PSD]

104) The Owner/Operator of S-4227, S-4228, and S-4229 Claus Plants (SRUs) shall not exceed any of the following total sulfur production levels until both of the following are met:

a) At least one of the new hydrogen plant trains (S-4471 or S-4472) has started to use refinery fuel gas or process gas as a feedstock, and

b) At least one of the SRUs has been modified or has completed its modification to satisfy BACT per this Authority to Construct.

- S-4227: 189.6 long tons in any calendar day and 150 long tons per day averaged over any consecutive 12-month period.
- S-4228: 179.0 long tons in any calendar day and 150 long tons per day averaged over any consecutive 12-month period.
- S-4229: 336.0 long tons in any calendar day and 292.7 long tons per day averaged over any consecutive 12-month period.

After each of the SRUs (S-4227, S-4228, and S-4229) is modified, the Owner/Operator shall operate only the modified SRU up to the maximum new total sulfur production limit specified in Part 87.
[Basis: Cumulative Increase, PSD]

105) During the Renewal Project Power Plant Replacement Commissioning Period (as defined in Part 47):

The owner/operator of S-4473 gas turbine and S-4474 duct burner combined shall not exceed 63.37 tons in any consecutive 12-month period of NOx emissions during the commissioning period. Except during the commissioning period, the owner/operator of S-4473 and S-4474 shall comply with the NOx emissions limit specified in part 42. The owner/operator shall comply with all other emissions limits in part 42

During the Renewal Project CCRR Commissioning Period (as defined in Part 67):

The owner/operator of S-4477, S-4478, S-4479, S-4480 CCRR furnaces combined shall not exceed 21.35 ton in any consecutive 12-month period of CO emissions during the commissioning period. Except during the commissioning period, the owner/operator of S-4473 and S-4474 shall comply with the CO emissions limit specified in part 62. The owner/operator shall comply with all other emissions limits in part 62.

Prior to the commencement of the Renewal Project Commissioning Period, the Owner/Operator shall provide on-site emission reduction credits (ERCs) for 29.46 tons/year NOx and 5.15 tons/year CO. The Owner/Operator may submit a banking application for any surplus NOx and CO ERCs in accordance with Regulation 2, Rule 4 provisions after the Renewal Project Commissioning Period terminates.
[Basis: Cumulative Increase, Offsets, PSD]

106) The owner/operator of all sources covered by this permit application (A/N 12842) shall determine the Renewal Project net emissions increase for PSD purposes using the District-approved calculation method specified in the federal PSD regulations at 40 CFR 52.21. The owner/operator shall ensure that the Renewal Project net emissions increase does not exceed any of the following PSD net emissions increase thresholds:

- NOx 40 tons/year
- CO 100 tons/year
- SOx 40 tons/year
- PM10 15 tons/year
- Hydrogen Sulfide 10 tons/year
- Total Reduced Sulfur 10 tons/year
- Reduced Sulfur Compounds 10 tons/year
- Sulfuric Acid Mist 7 tons/year

[Basis: Cumulative Increase, Rule 2-2-306, federal PSD regulations at 40 CFR 52.21]

107) The Owner/Operator of the sources listed in this part shall use the following District-approved data in order to demonstrate that the total Renewal Project net emissions increases do

not exceed the PSD thresholds listed in part 106:

a) NOx and O2: District-approved continuous emissions monitors (CEMs) data and District-approved flow rate data for S-4471, S-4472, S-4473/S-4474, S-4477, S-4478, S-4479, and S-4480, S-4436/S-4227, S-4437/S-4228, and S-4438/S-4229, or the permitted emissions rate, whichever is greater. Part 27 emission factor for S-6021 multiplied by flare gas flow. Part 57 stack concentration of 42 ppm NOx, dry, corrected to 1% oxygen (as NO2) unless District-approved source test results demonstrate a higher NOx concentration in which case the higher NOx concentration shall be used multiplied by the higher of either the maximum permitted flowrate or the measured flowrate in order to determine mass emissions for S-4452 CCRR Vent.

b) CO and O2: District-approved continuous emissions monitors (CEMs) data and District-approved flow rate data for S-4471, S-4472, S-4473/S-4474, S-4477, S-4478, S-4479, S-4480, S-4436/S-4227, S-4437/S-4228, and S-4438/S-4229, or the permitted emissions rate, whichever is greater. Part 27 emission factor for S-6021 multiplied by flare gas flow. Part 57 stack concentration of 500 ppm CO dry, corrected to 1% oxygen, unless District-approved source test results demonstrate a higher CO concentration in which case the higher CO concentration shall be used multiplied by the higher of either the maximum permitted flowrate or the measured flowrate in order to determine mass emissions for S-4452 CCRR Vent.

c) SO2 (as SO2) and O2: District-approved continuous emissions monitors (CEMs) data and District-approved flow rate data for S-4436/S-4227, S-4437/S-4228, and S-4438/S-4229, or the permitted emissions rate, whichever is greater. Calculated per part 9c for S-4471 and S-4472. Part 27 emission calculation method (total sulfur in the vent gas multiplied by the flare gas flow assuming 100% conversion of TS to SO2 plus the flare pilot TS to SO2). Part 57 either: the permitted stack concentration of 31 ppm dry, corrected to 1% oxygen, unless source test results demonstrate a higher SO2 concentration in which case the higher SO2 concentration shall be used multiplied by the higher of the

permitted or measured District-approved flow rate in order to determine mass emissions for S-4452. Calculated per Part 63 for S-4477, S-4478, S-4479, and S-4480 or the permitted level whichever is greater. Calculated per part 95 for S-4473/S-4474 or the permitted level whichever is greater.

d) PM10: The owner/operator shall perform District-approved source tests for S-4471, S-4472, S-4473/S-4474, S-4477, S-4478, S-4479, S-4480, S-4436/S-4227, S-4437/S-4228, and S-4438/S-4229 under variable load conditions in order to demonstrate compliance with the permitted emissions rates and levels. The source test procedures including loads run per source shall be pre-approved by the District in accordance with the applicable parts of 109 through 117. In addition, for S-6021, PM10 emissions shall be calculated using the Part 27 emissions factors multiplied by District-approved flare gas flow, and for S-4452, the Part 57 stack concentration of 0.0083 grains/dscf unless District-approved source test results demonstrate a higher PM10 concentration in which case the higher PM10 concentration shall be used, multiplied by the higher of the permitted or measured District-approved flow rate for S-4452 shall be used to calculate PM10.

For Sulfuric Acid Mist, Hydrogen Sulfide, Total Sulfur, the Renewal Project will result in a net emission reductions from pre-project baseline. [Basis: Cumulative Increase, PSD]

108) The Owner/Operator of all of the Renewal Project sources shall submit a report to the District no later than 30 days from the end of each calendar month that demonstrates that the higher of either the permitted or actual total Renewal Project source net emissions increases do not exceed the PSD thresholds specified in part 106.
[Basis: Reporting Requirements, PSD]

GENERAL RECORDKEEPING CONDITIONS

109) The Owner/Operator of all sources covered by this permit application (A/N 12842) shall maintain a District-approved log that contains all CEM and source test records and all records of fuel usage rates, fuel types, quantity of each type of fuel used at each source, heat

content HHV of fuel (in Btu/scf), TS levels in fuels used, hours of operation (including each mode (dryout/warmup, commissioning, startup, shutdown), District-approved flow rate used in emissions estimates (scf/hour), hourly, daily and annual emissions estimates, and other records as specified by the APCO for the last 5 years of operation to verify compliance with Renewal Project permit conditions. [Basis: Recordkeeping]

110) The Owner/Operator of all sources covered by this permit application (A/N 12842) shall maintain the following in a District-approved log and shall keep these records on site for a period of at least 5 years from date of entry and make the records available to District staff upon request (note the Hydrogen Plant Replacement Project is covered by similar conditions in parts 37 and 38). [Basis: Regulation 2-1-301, Recordkeeping]

In order to demonstrate compliance with part 56, the Owner/Operator of S-4452 CCRR, S-4477 through S-4480 CCRR Furnaces, shall maintain calendar day, monthly, and consecutive 12-month total material feed throughputs for the S-4452 CCRR and total fuel usage for S-4477 through S-4480 CCRR Furnaces, and the owner/operator shall maintain District-approved method and results for demonstrating compliance with parts 57, 60, 61, 62, 63, 65, 66, 67, 68, 69, 70, 73, and 76;

In order to demonstrate compliance with part 77, the Owner/Operator of S-4454 #6H2S Plant Recycle Amine Regenerator shall maintain calendar day, monthly, and consecutive 12-month total H2S produced, in MMSCF, for the S-4454 Plant/Recycle Amine Regenerator;

In order to demonstrate compliance with part 80, the Owner/Operator of S-4253 shall maintain calendar day, monthly, and consecutive 12-month total material feed throughputs for the S-4253 TKC/FCC Feed Hydrotreater; and

In order to demonstrate compliance with part 78, the Owner/Operator of S-4490 shall maintain calendar day, monthly, and consecutive 12-month total sulfur loaded, in long tons, at the S-4490 Sulfur Loading Rack, Abated by A-310 Scrubber.

In order to demonstrate compliance with parts 81

through 95, the Owner/Operator of each Sulfur Recovery Units S-4227 through S-4229 shall maintain calendar day, monthly, and consecutive 12-month total material throughputs (in long tons) for each SRU, acid gas feed rates (MMscf), CEM data, H2S emissions, PM10 Sulfuric Acid Mist, records for work performed in part 86, source test results, combined annual emissions for part 90, the individual emissions limits for part 92, sulfuric acid mist from each stack for part 95, and fugitive H2S for part 95 for the S-4227 through S-4229

In order to demonstrate compliance with part 80, the Owner/Operator of S-4253 shall maintain calendar day, monthly, and consecutive 12-month total material feed throughputs for the S-4253 TKC/FCC Feed Hydrotreater; and

In order to demonstrate compliance with part 42, the Owner/Operator of S-4473 and S-4474 Gas Turbine and Duct Burner shall maintain calendar day, monthly, and consecutive 12-month for all records for demonstrating compliance with parts 42, 45, 46, 49, 51, 53, and 54.

111) The Owner/Operator of all sources covered by this permit application (A/N 12842) shall submit a quarterly report to both the Compliance and Enforcement Division and Engineering Division no later than 60 days following the end of each calendar quarter addressing compliance with parts 9, 42, 57, 62, 90, 92, and 95. Each quarterly report shall include for each source the source test dates in which limits of these conditions were exceeded. The District shall use this information to determine any periods of non-compliance with the emission limits. [Basis: Reporting Requirements]

112) In the absence of any specific permit condition, the owner/operator of all sources covered by this permit application (A/N 12842) shall maintain adequate records in order to demonstrate compliance with all parts of these conditions.

GENERAL SOURCE TESTING CONDITIONS

113) The Owner/Operator of all sources covered by this permit application (A/N 12842) shall provide District pre-approved stack sampling ports and platforms, the locations of which

shall be subject to the pre-approval of the District. The owner/operator shall conduct only District pre-approved source tests using District pre-approved methods for all source tests to be approved by the District. [Basis: Regulation 1-501]

114) Upon successful completion of the requirements of parts 109 through 111, the owner/operator of sources subject to parts 19, 54, 73, 90, 91, and 92 shall satisfy the TAC source test requirements by compliance with part 112. [Basis: Rule 2-5]

TAC/HAP SOURCE TESTING CONDITIONS

115) The Owner/Operator of all sources covered by this permit application (A/N 12842) shall conduct initial District-approved source tests to demonstrate compliance with the TAC mass emissions rates (including a full metals test) specified in parts 19, 54, 73 (not including benzene fugitives), and 95 (not including H2S fugitives). Each initial test shall be taken no later than 120 days from the date of initial startup of each source. The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of 109 to 117. The Owner/Operator shall submit the source test results to the District staff no later than 60 days from the date of the source test. [Basis: Rule 2-5, Source Tests]

116) The Owner/Operator of all sources covered by this permit application (A/N 12842) shall conduct a District-approved source test annually following completion of each initial source test in part 115 to demonstrate compliance with the emission limits (including a full metals test) specified in parts 19, 54, 73 (not including benzene fugitives), and 95 (not including H2S fugitives). The owner/operator may be required by the APCO to conduct more frequent source tests if source test results indicate emissions are within 90% or exceeds any emissions or concentrations limits or any emissions limit associated with any of these sources. The Owner/Operator shall conduct the District approved source tests in accordance with the applicable parts of 109 to 117. The owner/operator shall conduct the annual emissions source tests at least 9 months apart.

The owner/operator shall use maximum permitted annual throughput rates and the source test results in order to demonstrate compliance with annual limits, and maximum hourly throughput rates and the source test results in order to demonstrate compliance with hourly limits subject to District approval. The Owner/Operator shall submit the source test results to the District staff no later than 60 days from the date of the source test. Should any of these values exceed a part 19, 54, 73 (not including benzene fugitives), or 95 (not including H2S fugitives) emission limit, the current health risk screening assessment (HRSA) on file with the District for the Renewal Project demonstrating compliance that each source remains less than or equal to 0.20 chronic non-cancer hazard index and that each source's cancer risk remains less than or equal to 1.0 in a million, the owner/operator shall re-run the HRSA subject to District approval in order to determine compliance that each source remains less than or equal to 0.20 chronic non-cancer hazard index and that each source's cancer risk remains less than or equal to 1.0 in a million.

Within 60 calendar days from the date of the source test results, the owner/operator shall submit the results of the re-run HRSA to the District for approval. If the results of the re-run HRSA demonstrate non-compliance with the originally approved Rule 2-5 HRSA (which did not require TBACT and that each source remains less than or equal to 0.20 chronic non-cancer hazard index and that each source's cancer risk remains less than or equal to 1.0 in a million) on file at the District for the Renewal Project, then the owner/operator shall be considered to be in violation of both Rule 2-5 and 2-1-307 back to the date of the test.

If the results of the re-run HRSA demonstrate compliance that each source remains less than or equal to 0.20 chronic non-cancer hazard index and that each source's cancer risk remains less than or equal to 1.0 in a million, then the owner/operator shall submit a permit application to the District in order to change the TAC emission limit permit conditions, within 30 calendar days from the date of the re-run submittal.
[Basis: Rule 2-5, Source Tests]

117) The Owner/Operator of all sources covered by this permit application (A/N 12842) shall submit source test procedures to the District's Source Test Section at least 14 calendar days prior to conducting any source test required by these conditions. The Owner/Operator shall comply with all applicable testing requirements for continuous emissions monitors. The Owner/Operator shall notify the District's Source Test Section, in writing, of the source test protocols and projected test dates at least 7 days prior to testing.
[Basis: cumulative increase, Rule 2-5]

End of Conditions