

# **GENERAL DYNAMICS NASSCO**

## **2025 RISK REDUCTION AUDIT AND PLAN**

### **BASED ON 2021 EMISSIONS INVENTORY HEALTH RISK ASSESSMENT**

**March 26, 2025**



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<b>TABLE OF CONTENTS</b>	<b>PAGE</b>
ACRONYMS AND ABBREVIATIONS .....	iii
1 INTRODUCTION.....	1-1
2 RISK CHARACTERIZATION .....	2-1
2.1 ESTIMATED Cancer Risk.....	2-1
2.2 Estimated Noncancer Chronic Risk .....	2-3
2.3 Estimated Noncancer Acute Risk .....	2-5
3 HISTORICAL EMISSION REDUCTIONS .....	3-1
3.1 Pre-2021 Emission Reductions.....	3-1
3.1.1 Blasting and Painting Facilities.....	3-1
3.1.2 Welding Emission Reductions.....	3-2
3.1.3 Diesel Emission Reductions.....	3-3
3.2 Post-2021 Emission Reductions .....	3-4
3.2.1 Further Diesel Emission Reductions .....	3-5
3.2.2 Renewable Diesel .....	3-5
4 PROPOSED RISK REDUCTION AUDIT AND PLAN MEASURES.....	4-1
4.1 Noncancer Risk Reductions.....	4-1
4.1.1 Welding Material Selection.....	4-1
4.2 Cancer Risk Reductions .....	4-4
4.2.1 Fume Capture and Filtration at Weld School.....	4-4
4.2.2 Crane Engine Replacements .....	4-4
4.3 Emission Reduction Measures For Future Consideration.....	4-5
4.3.1 Welding Operations.....	4-5
4.3.2 Cranes .....	4-5
4.3.3 Future Considerations.....	4-6
5 UPDATED HEALTH RISK ASSESSMENT .....	5-1
6 OVERALL SCHEDULE AND PROGRESS REPORTS .....	6-1

## **FIGURES**

Figure 2-1. Estimated Cancer Isopleth of 10 in One Million .....	2-1
Figure 2-2. Estimated Cancer, MEIR, 30-year, Chemical Contribution .....	2-2
Figure 2-3. Estimated Cancer, MEIR, 30-year, Source Contribution .....	2-2
Figure 2-4. Estimated Noncancer Chronic Isopleth of 1.0 .....	2-3
Figure 2-5. Estimated Noncancer Chronic, MEIW, Chemical Contribution .....	2-4
Figure 2-6. Estimated Noncancer Chronic, MEIW, Source Contribution .....	2-4
Figure 2-7. Estimated Noncancer Acute HHI Isopleth of 1.0 .....	2-5
Figure 2-8. Estimated Noncancer Acute, MEIR, Chemical Contribution .....	2-6
Figure 2-9. Estimated Noncancer Acute, MEIR, Source Contribution .....	2-6
Figure 3-1. NASSCO Blast and Paint Facility .....	3-2
Figure 3-2. NASSCO Thin Panel Plate Line Operation .....	3-3
Figure 3-3. Electric Compressors at NASSCO .....	3-4
Figure 3-4. Crane 10, Repowered with a Tier 4F Engine .....	3-5
Figure 4-1. Welding on Vessel Hull from Mobile Elevated Work Platforms .....	4-5

## **TABLES**

Table 5-1. Summary of Emissions from Proposed Risk Reduction Measures .....	5-1
Table 5-2. Summary of Estimated Risks from Proposed Risk Reduction Measures .....	5-1
Table 6-1. NASSCO 2025 RRAP Overall Schedule .....	6-1

## **ATTACHMENTS**

Attachment A	General Application Form for RRAP
Attachment B	Emission Reductions for RRAP
Attachment C	HRA Modeling Files for RRAP

## **ACRONYMS AND ABBREVIATIONS**

BMP	best management practice
DPF	diesel particulate filter
DPM	diesel particulate matter
HEPA	high efficiency particulate air
HHI	health hazard index
HRA	health risk assessment
MEIR	maximum exposed individual resident
MEIW	maximum exposed individual worker
NASSCO	National Steel and Shipbuilding Company
OEHHA	Office of Environmental Health Hazard Assessment
RRAP	risk reduction audit and plan
RTO	regenerative thermal oxidizer
SCR	selective catalytic reduction
SDAPCD	San Diego Air Pollution Control District
SOC	stage of construction
TAC	toxic air contaminant
VOC	volatile organic compound

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## 1 INTRODUCTION

On October 23, 2023, General Dynamics National Steel and Shipbuilding Company (NASSCO) submitted a health risk assessment (HRA) to the San Diego Air Pollution Control District (SDAPCD or the District) to assess potential health risks due to emissions from operations at the NASSCO facility located at 2798 E. Harbor Drive, along the San Diego Bay in San Diego, California. The HRA was based on NASSCO's 2021 approved emissions inventory. The HRA was prepared following the guidelines of California's Office of Environmental Health Hazard Assessment's (OEHHA) Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments published in February of 2015, and the SDAPCD Supplemental Guidelines for Submission of Air Toxics "Hot Spots" Program Health Risk Assessments (HRAs) published in July 2022. The HRA was based on the April 2022 Hotspots Analysis and Reporting Program Risk Assessment Standalone Tool Version 22118 and the Lindbergh Field (San Diego International Airport) meteorological data that were processed and provided by the District.

The District and OEHHA provided comments on the HRA on April 11, 2024. In response to the comments, NASSCO submitted a revised HRA to the District on June 6, 2024, and another revision on August 16, 2024. The second revised HRA, approved on September 27, 2024, shows that the potential residential cancer risk, worker chronic risk, residential acute risk, and worker acute risk exceed the public notification and risk reduction levels specified in District Rule 1210, sections (d)(1) and (e)(1), respectively. Public Notifications were mailed out in December 2024 and a public meeting was held on January 21, 2025. The Risk Reduction Audit and Plan (RRAP) is due to the District by March 26, 2025. This document presents NASSCO's proposed plan for auditing and reducing potential health risk to the affected public from NASSCO's 2021 emissions.

This RRAP includes the following elements as required by Rule 1210. Sections 2 through 6 present NASSCO's proposed risk reduction audit and plan to address each element.

- Facility name and location, *Rule 1210(e)(2)(i)*: NASSCO, 2798 E. Harbor Drive, San Diego, California 92113
- Facility risk characterization based on the 2021 HRA, *Rule 1210(e)(2)(ii)*: See Section 2.
- Proposed risk reduction measures, including schedule to implement measures and reduction to emissions and risk from the measure, *Rule 1210(e)(2)(iii-v)*: See Section 4.

- Updated emission inventory and health risk assessment based on reduction measures that have occurred since 2021 and as proposed in this plan, *Rule 1210(e)(2)(ii)*: See Section 5.
- Schedule for providing progress reports, *Rule 1210(e)(2)(vi)*: See Section 6.



## 2 RISK CHARACTERIZATION

This section discusses the risk characterization from the 2021 HRA, specifically those estimated risks that were above the public notification and risk reduction thresholds.

### 2.1 ESTIMATED CANCER RISK

NASSCO's estimated potential cancer risk for calendar year 2021 exceeded the risk reduction threshold of 10 in one million for residential exposure. The potential cancer risk at the maximum exposed individual resident (MEIR) was estimated to be 28.4. The number of residences estimated to be exposed to a level between 10 and 28.4 in one million is 217 households. The orange line in Figure 2-1 is the contour line representing an estimated cancer risk of 10 in one million.

Figure 2-1. Estimated Cancer Isopleth of 10 in One Million



(ref: Figure 3-1. AB 2588 Air Toxics "Hot Spots" Health Risk Assessment Volume 1, 16 August 2024)

The primary chemical driving the estimated cancer risk is hexavalent chromium, which contributed 41.6%, followed by nickel at 19.0%. A breakdown of the overall chemical contribution to estimated cancer risk, based on the MEIR, is shown in Figure 2-2. The primary source driving the estimated risk of cancer is welding at 60.5%, followed by paint and solvent usage at 19.9%. A breakdown of the sources contributing to the estimated cancer risk, based on the MEIR, is shown in Figure 2-3.

Figure 2-2. Estimated Cancer, MEIR, 30-year, Chemical Contribution

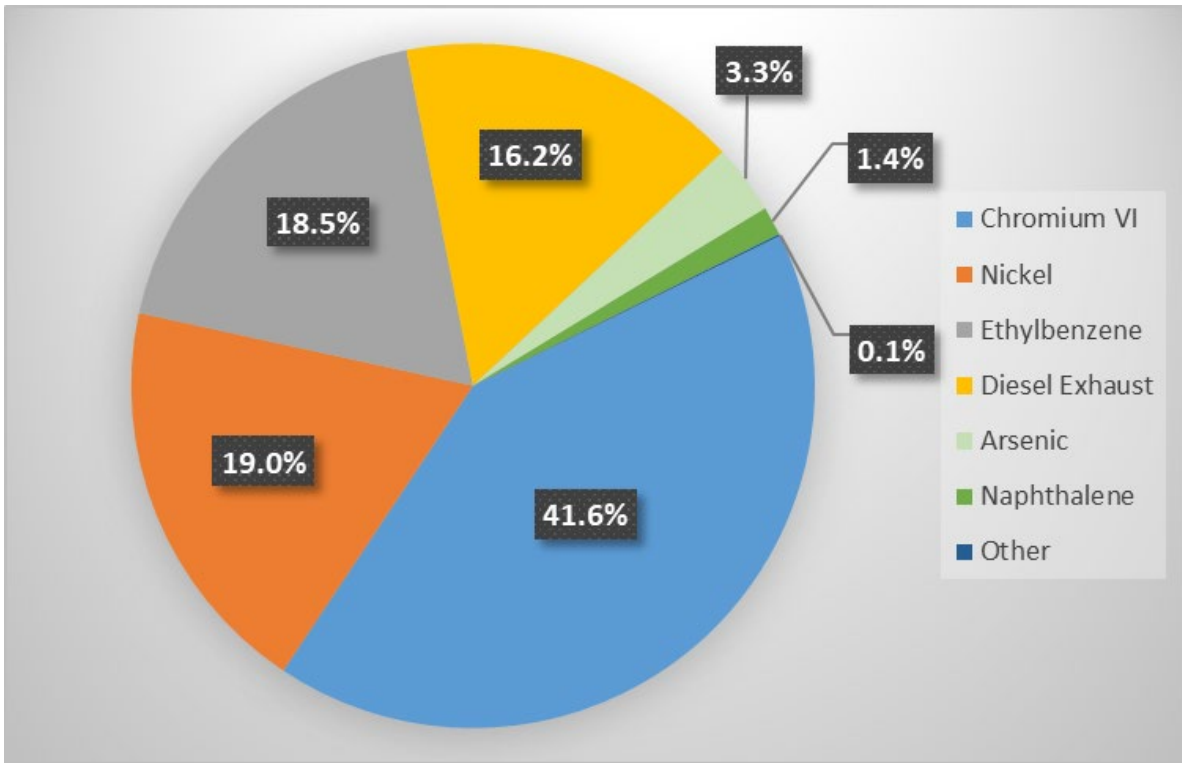
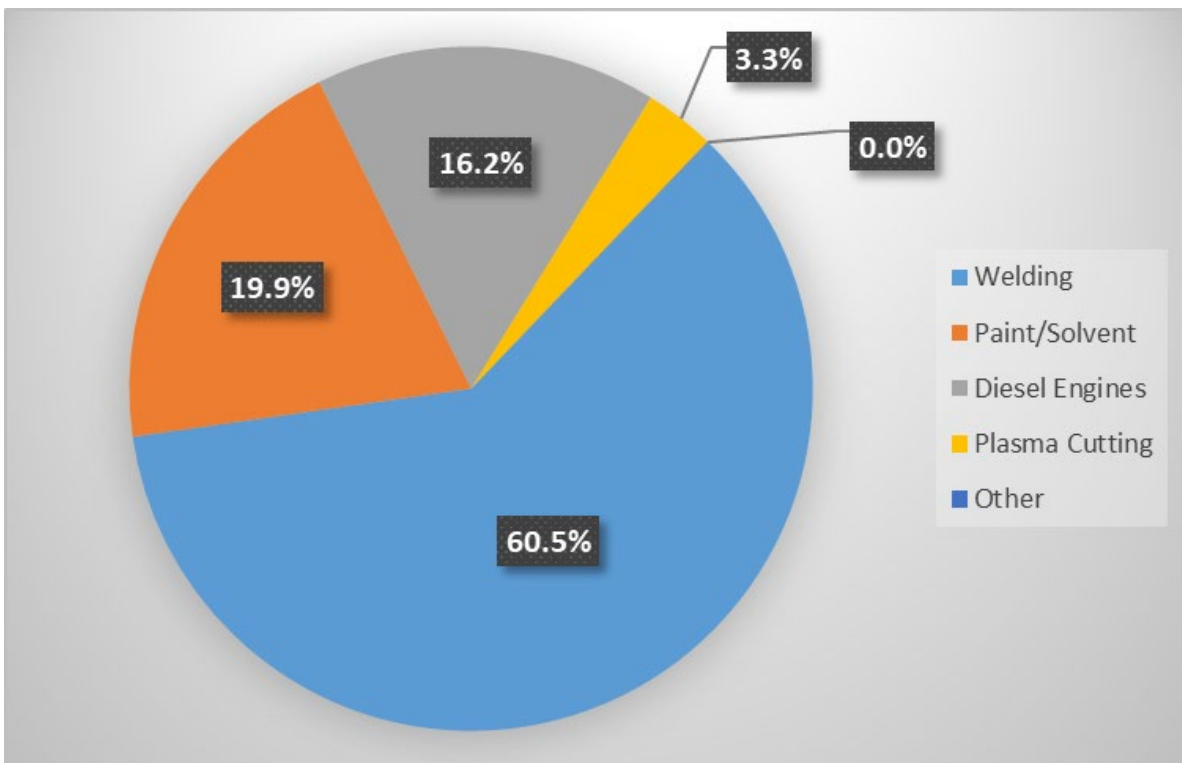


Figure 2-3. Estimated Cancer, MEIR, 30-year, Source Contribution



## 2.2 ESTIMATED NONCANCER CHRONIC RISK

NASSCO's noncancer chronic health hazard index (HHI), the metric used to estimate potential noncancer risk, exceeded the risk reduction threshold of 1.0 for off-site worker exposure in calendar year 2021. The chronic HHI at the maximum exposed individual worker (MEIW) was estimated to be 1.07. Four businesses are estimated to have been exposed in 2021 to a level between 1 and 1.07. The orange line in Figure 2-4 is the contour line representing an acute risk of 1.0.

**Figure 2-4. Estimated Noncancer Chronic Isoleth of 1.0**



(ref: Figure 3-2. AB 2588 Air Toxics "Hot Spots" Health Risk Assessment Volume 1, 16 August 2024)

The primary chemical driving the estimated noncancer chronic risk is nickel, which contributed 90.4%, followed by arsenic at 8.1%. A breakdown of the overall chemical contribution to estimated noncancer chronic risk, based on the MEIW, is shown in Figure 2-5. The primary source driving the estimated noncancer chronic risk is welding at 89.7%, followed by metal cutting at 8.7%. A breakdown of the sources contributing to the estimated noncancer risk, based on the MEIW, is shown in Figure 2-6.

Figure 2-5. Estimated Noncancer Chronic, MEIW, Chemical Contribution

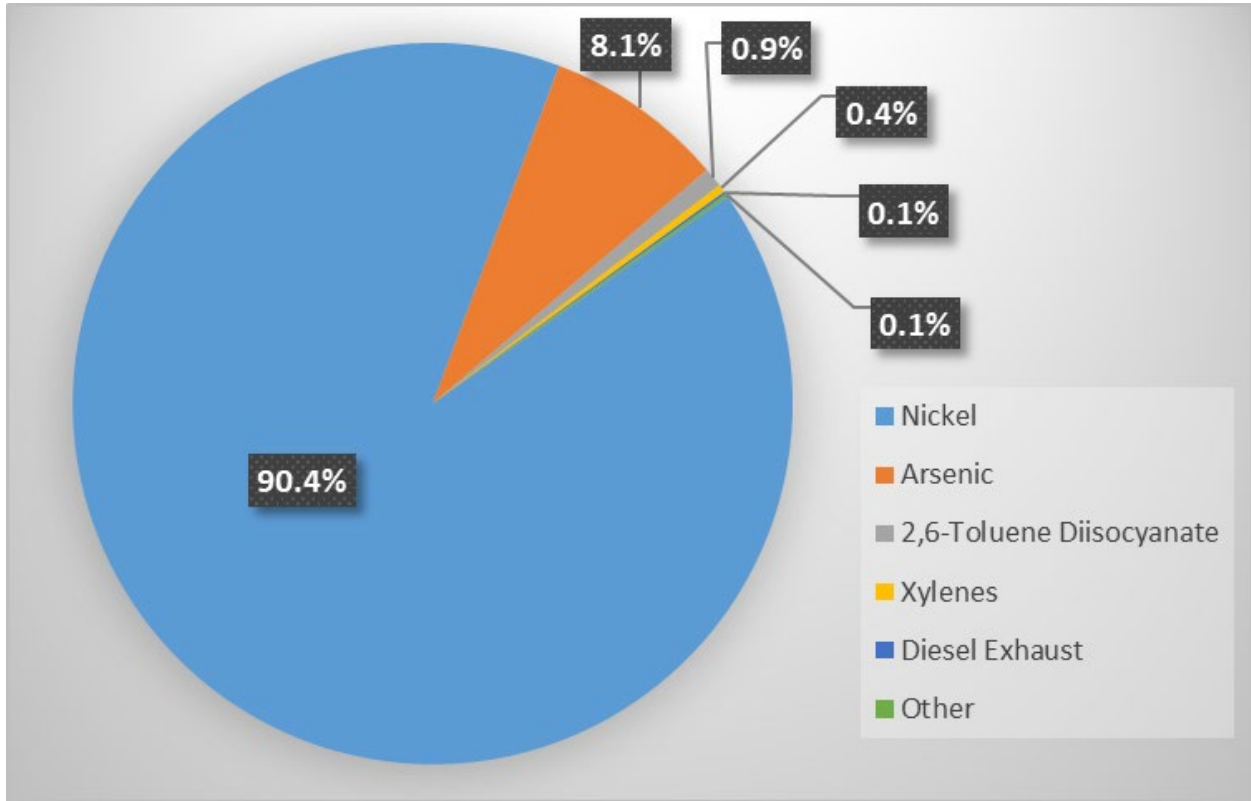
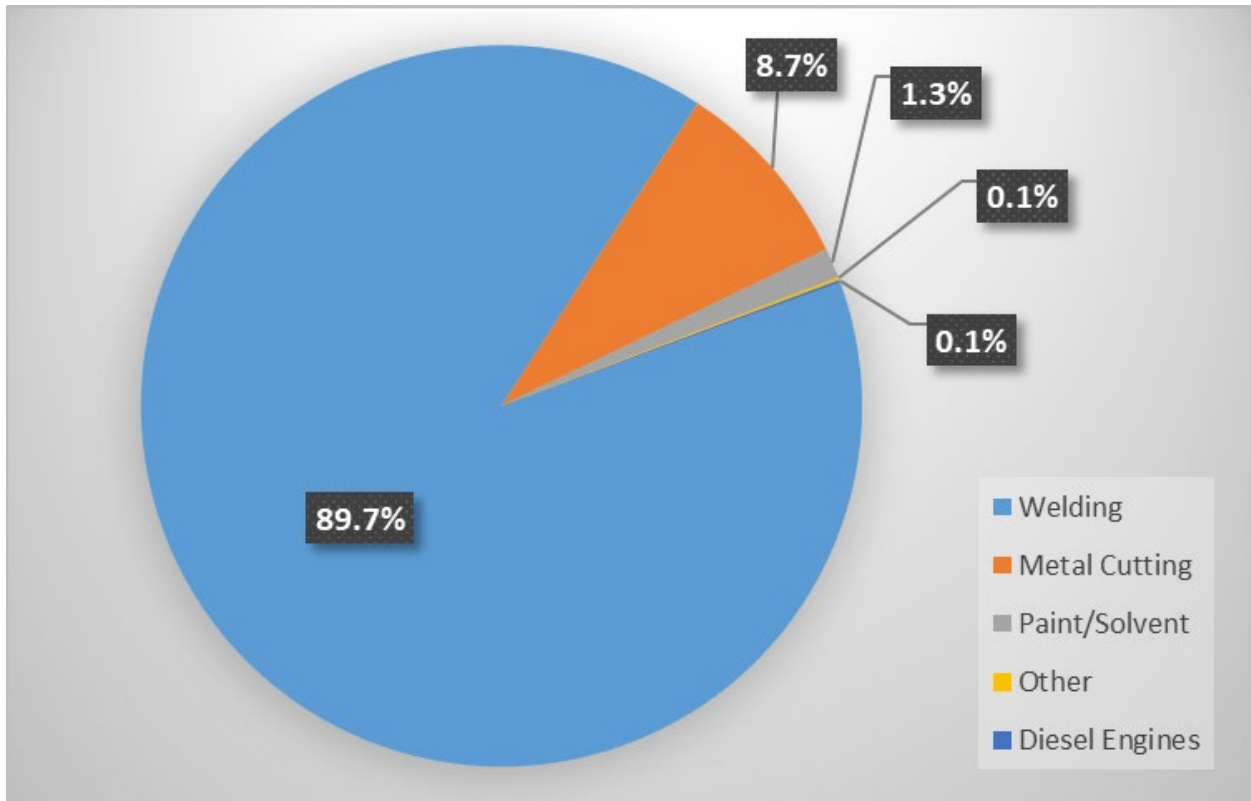


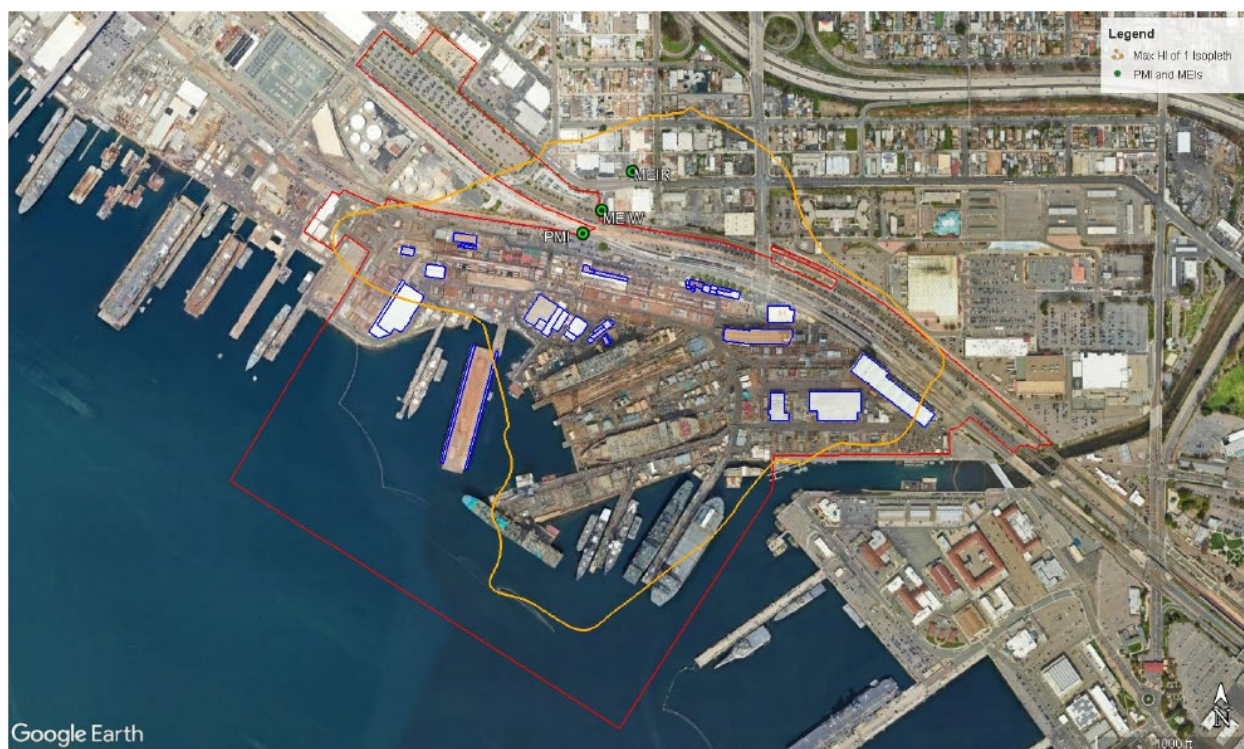
Figure 2-6. Estimated Noncancer Chronic, MEIW, Source Contribution



## 2.3 ESTIMATED NONCANCER ACUTE RISK

NASSCO's potential noncancer acute HHI exceeded the risk reduction threshold of 1.0 for both resident and off-site worker exposure in 2021. The acute HHI at the MEIR was estimated to be 1.19, and at the MEIW was estimated to be 1.41. Thirteen residences are estimated to have been exposed to a level between 1 and 1.19 in 2021; Thirty-one businesses with workers are estimated to have been exposed to a level between 1 and 1.41. The orange line in Figure 2-7 is the contour line representing an acute risk of 1.0.

**Figure 2-7. Estimated Noncancer Acute HHI Isopleth of 1.0**



(ref: Figure 3-3. AB 2588 Air Toxics "Hot Spots" Health Risk Assessment Volume 1, 16 August 2024)

The primary chemical driving the estimated noncancer acute risk in 2021 was nickel at 99.3%, while benzene contributed to 0.6% of the risk.

The primary sources contributing to nickel emissions from NASSCO operations are welding (94.4%), abrasive blasting and metal cutting (3.1%), and diesel engines (i.e., compressors and cranes) (2.5%). Figures 2-8 and 2-9 present the chemical and source contributions to the acute HHI at the MEIR, respectively.

Figure 2-8. Estimated Noncancer Acute, MEIR, Chemical Contribution

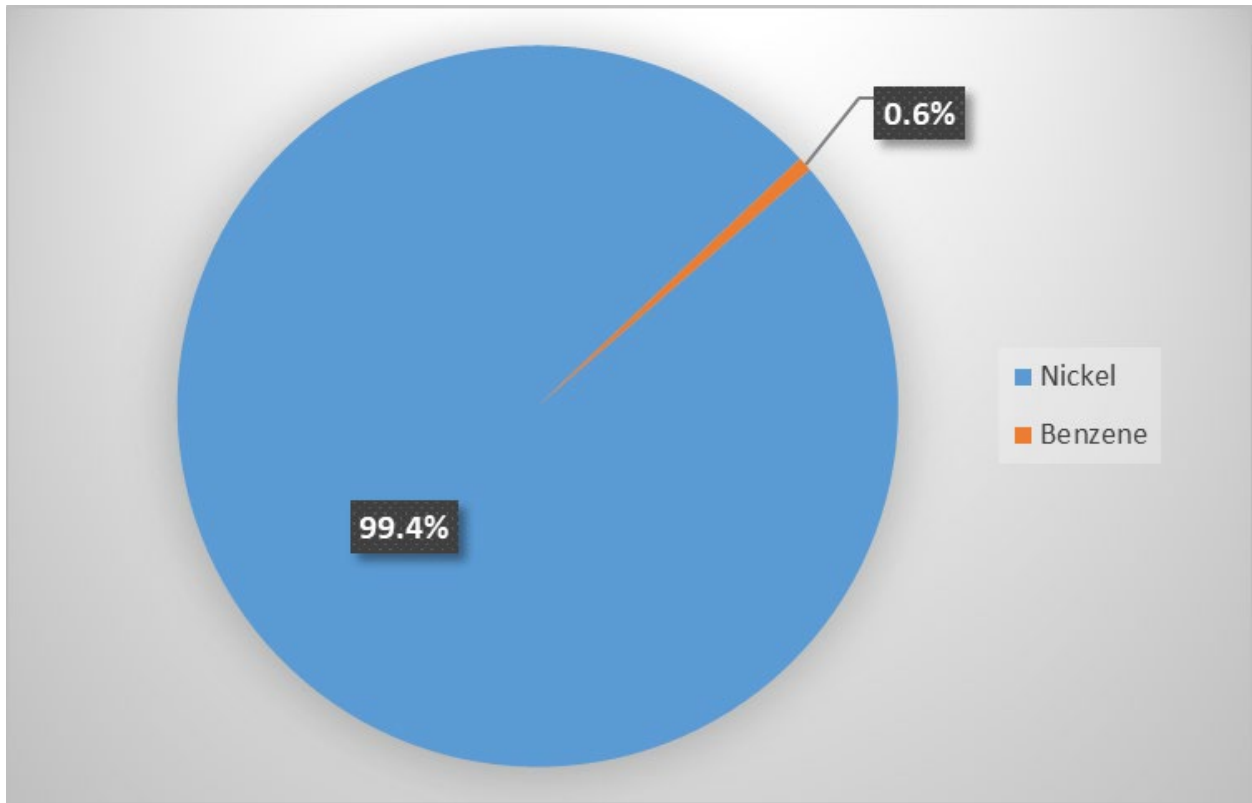
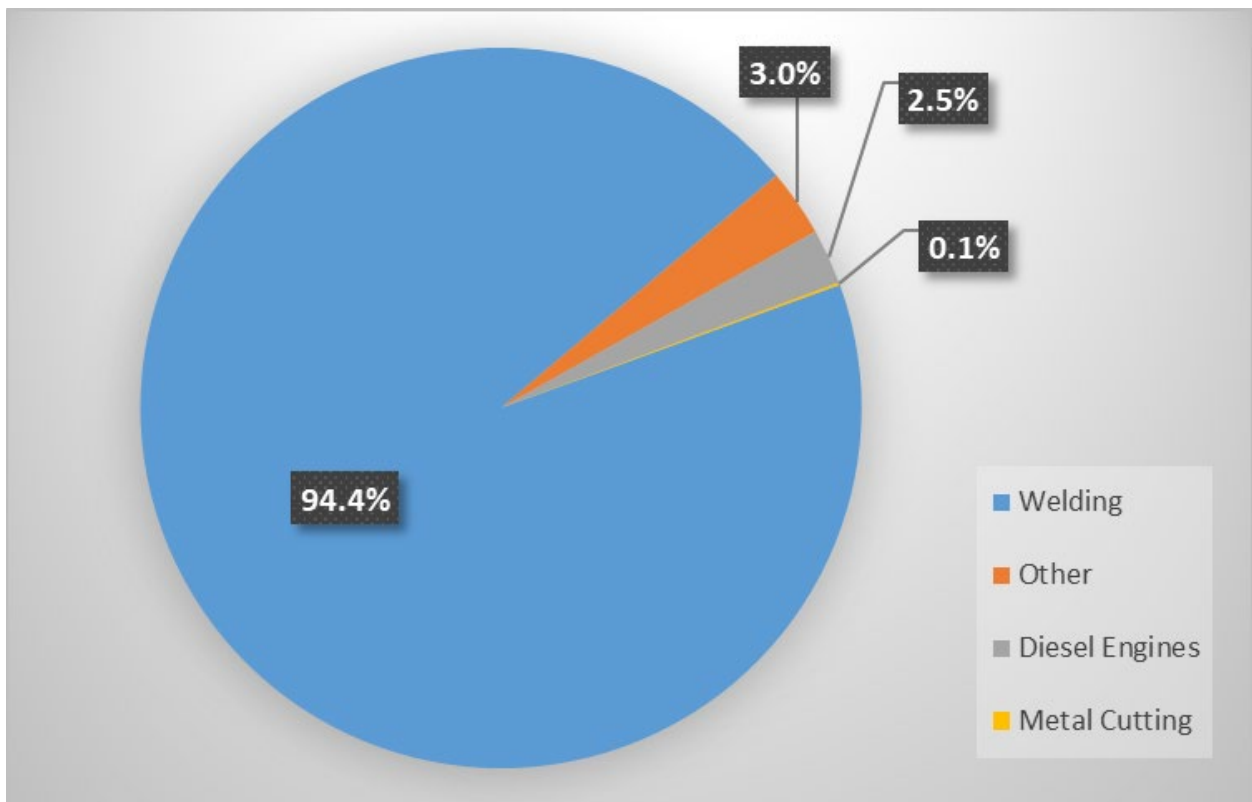


Figure 2-9. Estimated Noncancer Acute, MEIR, Source Contribution



### **3 HISTORICAL EMISSION REDUCTIONS**

As the only full-service shipyard on the West Coast of the United States, NASSCO understands the importance of being a good steward of the environment. NASSCO operates a robust sustainability program encompassing air, water, energy, recycling, and pollution prevention. NASSCO has voluntarily implemented initiatives to reduce environmental impacts from its activities, including those focused on reducing emissions of toxic air contaminants (TAC), which are emitted from welding, abrasive blasting, burning of diesel fuel in cranes and other equipment, and use of paints, solvents, and adhesives.

In addition to initiatives that reduce emissions from NASSCO's stationary source activities, NASSCO features an award-winning alternate commuting program with carpool, vanpool, and trolley ridership programs that help to reduce indirect emissions resulting from workers commuting to and from the shipyard. Over time, NASSCO's single occupancy vehicle rate has declined steadily. Independent employee surveys conducted by SANDAG in 2022 and 2024 determined NASSCO's single occupancy vehicle rate to be 69% and 64%, respectively, resulting in less road congestion and fewer emissions in the local community.

NASSCO has also been proactive in electrifying its on-road vehicle fleet, having acquired three electric buses, one electric semi-truck, and an electric work truck to further reduce mobile source emissions.

#### **3.1 PRE-2021 EMISSION REDUCTIONS**

NASSCO has implemented voluntary initiatives to reduce TAC emissions and risk to nearby communities and NASSCO's employees. These measures have reduced the estimated cancer risk from NASSCO's 2013 operations from 53 in one million (0.0053%) to 28 in one million (0.0028%) in 2021, even as new toxics and more stringent health factors have been routinely identified and added to District rules. Some of NASSCO's initiatives that have had significant impacts are described below.

##### **3.1.1 Blasting and Painting Facilities**

To achieve voluntary reduction actions (not required by any local, state, or federal regulation), NASSCO commissioned several emissions control systems to capture particulate matter and volatile organic compounds (VOCs) from its blasting and painting operations. These operations prepare and protect the steel used in ship construction from corrosion and rust over time.

### 3.1.1.1 Primer Lines

In the early ship construction phases, steel plates are blasted clean of rust and coated with preconstruction primer at two primer line facilities. Each primer line features dust collection and regenerative thermal oxidizer (RTO) systems to capture and control particulate and VOCs before they exhaust to the atmosphere.

### 3.1.1.2 Blast and Paint Cells

In 2009, NASSCO commissioned a 66,000-square foot blast and painting facility, consisting of two blasting cells and five paint cells that fully enclose and control their operations (Figure 3-1). The blast cells fully capture dust generated during the blasting process and process emissions are controlled by powerful dust collector systems. Each paint cell captures and routes VOCs to an RTO that destroys VOCs such as ethylbenzene and xylene.

Since 2009, these systems have helped to reduce NASSCO's overall yard-wide emissions of VOCs by approximately 60%.

**Figure 3-1. NASSCO Blast and Paint Facility**



### 3.1.2 Welding Emission Reductions

Welding is a primary structural process at NASSCO and is integral to building ships. Modern shipbuilding is an “assembly line” process in which steel plates travel through various stages of construction (SOCs) and are welded into progressively larger, modular



structures known as blocks. These blocks are the foundation of the modular design and construction of vessels at NASSCO.

NASSCO follows EPA-recognized best management practices (BMPs) related to welding and reducing fumes, such as using gas-shielded welding methods and submerged arc welding whenever feasible and eliminating high fume-generating methods for stainless steel welding.

In addition to these BMPs, NASSCO installed several capture and control systems to reduce TAC emissions from its fixed, enclosed welding workstations within the facility. For example, NASSCO's Thin Panel Plate Line (Figure 3-2), Block Assembly Line, and Repair Shop feature fume capture and control systems with high-efficiency particulate air (HEPA) filters. As a result, NASSCO has reduced welding emissions in these locations by at least 90%.

**Figure 3-2. NASSCO Thin Panel Plate Line Operation**



### **3.1.3 Diesel Emission Reductions**

Over the past 20 years, NASSCO has undertaken several additional actions to reduce emissions from portable diesel equipment including upgrades to electrical infrastructure to reduce reliance on diesel equipment and retirement of older (and higher emitting) diesel engines.

While most of the cranes used in the shipyard are electrically powered, there are nine diesel whirly portal cranes that operate on a system of rails to erect ship blocks and move components within the shipyard. These nine cranes utilize non-road diesel engines for both propulsion and operational power needs but are regulated as part of the stationary source. NASSCO previously retrofit all nine cranes with EPA certified diesel engines equipped with diesel particulate filters (DPF), capable of greater than 85% reduction of diesel particulate matter (DPM). Additionally, six of the largest cranes were retrofitted with state-of-the-art selective catalytic reduction (SCR) aftertreatment systems, used primarily to reduce oxides of nitrogen, a precursor to ground-level ozone and a key component of smog.

Furthermore, in 2019, NASSCO implemented a policy requiring subcontractors to use solely electric or EPA Tier 4 Final-engine portable equipment such as compressors and emergency generators (Figure 3-3).

The voluntary measures described above reduced overall DPM emissions between 2005 and 2021 by an estimated 90%.

**Figure 3-3. Electric Compressors at NASSCO**



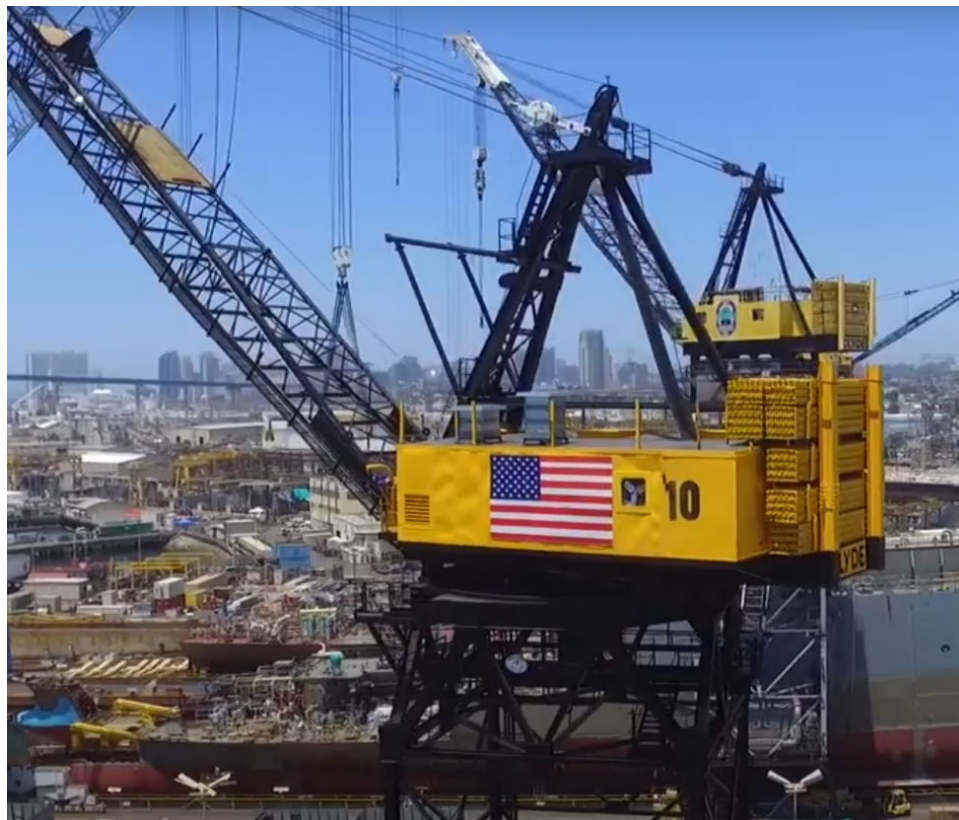
### **3.2 POST-2021 EMISSION REDUCTIONS**

The following measures have been implemented since 2021 and were not reflected in the 2021 approved emissions inventory used in the HRA.

### 3.2.1 Further Diesel Emission Reductions

NASSCO repowered two whirley portal cranes, Cranes 10 and 11, with EPA certified Tier 4F engines, the cleanest engines available, in 2023. The repowering provided an additional 75% reduction in DPM emissions from these sources.

**Figure 3-4. Crane 10, Repowered with a Tier 4F Engine**



### 3.2.2 Renewable Diesel

In mid-2022, NASSCO transitioned to renewable diesel for use in stationary, portable, and mobile equipment operated within NASSCO. Renewable diesel is shown to reduce DPM emissions by approximately 30% when used in engines that are not equipped with DPFs. NASSCO has committed to source only renewable diesel when the product is available.

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## **4 PROPOSED RISK REDUCTION AUDIT AND PLAN MEASURES**

This section describes three risk reduction measures proposed by NASSCO to minimize estimated non-cancer and cancer risks levels associated with welding and diesel-powered equipment at the shipyard. The cumulative emissions reductions and their corresponding risk values are presented in Section 5, Table 5-1 and 5-2, respectively.

The estimated timelines for the measures presented herein may be delayed by any unavailability of materials and equipment, manufacturer delays, permitting delays, or other unforeseen interruptions. NASSCO intends to make every effort to implement measures in a reasonable time frame and expedite those steps under NASSCO's direct control.

### **4.1 NONCANCER RISK REDUCTIONS**

As noted in Section 2, nickel emissions from welding account for almost all estimated noncancer acute and chronic health risks for residents and workers within NASSCO's 2021 HRA isopleth.

Although welding occurs across all SOCs of NASSCO's shipyard, a significant portion takes place during its two earliest stages of construction along the fence-line and within the site's welding school. In its assessment of opportunities to reduce risk, NASSCO identified the actions described in the following sections within these areas to be viable and effective.

#### **4.1.1 Welding Material Selection**

One recognized engineering control measure for welding fume toxicity is to evaluate and select filler materials that contain lower amounts of an alloy's elemental composition and still meet the properties needed from the steel. As an alloy, various grades of steel differ in the amounts of each element present, such as manganese, chromium, and nickel, that lend specific properties like tensile strength, heat/corrosion resistance, etc. As such, the filler material for a specific type of steel and the steel itself tend to have similar chemical makeups.

Most fumes from welding processes originate from the filler material as electric current arcs through the material to contact the welding surface. The materials used in ship construction, as well as the welding methods, must meet specific chemical composition, quality, and performance standards as established by organizations such as the American Welding Society, International Maritime Organization, the United States Navy, and others. Therefore, NASSCO utilizes a variety of certified filler materials and welding methods for

each type of steel used in ship construction. NASSCO typically performs more than 99% of its welding operations on mild and high-strength steels and must meet their respective welding standards for chemical composition, quality, and performance.

In the case of these steel types, NASSCO utilizes several high-volume filler materials containing nickel in concentrations between 0.4% and 1.7%. NASSCO's welders use these high-volume materials interchangeably in the preliminary block construction areas known as SOCs 1 through 4. From its risk reduction assessment, NASSCO determined that most of the block welding standards at this point in the construction process allow for filler materials with a nickel content on the lower range (0.4%) to be used rather than the higher range (1.7%). However, higher-nickel material is needed to meet the weld standards of the steel joining blocks and ship hulls in the final stages of construction (SOCs 5 and 6).

NASSCO proposes to increase selection of lower-nickel welding filler material where feasible in SOCs 1 through 4, targeting use of at least 50% in these SOCs, to significantly reduce nickel emissions from welding.

#### **4.1.1.1 Welding Workstation Configurations**

Most of NASSCO's welding occurs in dynamic, open-plan laydown areas to support different block geometries and to allow cranes to move the blocks throughout the shipyard and on-board the vessel under construction. Therefore, the configuration of the welders' work areas will differ on a near-constant basis according to the needs of the block's shape and working conditions on-board. For this type of work area, it is exceedingly difficult to identify risk reduction measures that are feasible and safe across NASSCO's varying production scenarios.

That said, while most of the welding workstations are necessarily open and modular, there are several fixed welding stations throughout the shipyard where welding operations are more predictable. NASSCO identified one such area in SOC 2, known as the Plate Shop, which consists of multiple fixed welding workstations (located in an open welding space) with arm-mounted welding machines that assist welders in joining smaller steel plates into the assemblies that form a block.

These workstations, known as space arms, are configured to accommodate up to two welding machines fed by either a drum (typically weighing up to 500 pounds) or individual spool (weighing 15 pounds) of weld filler material. When configured for spool-fed welding machines, the filler material's identifying information is obscured to an observer and the

spool can be inadvertently changed to another type without notice. In contrast, the filler materials for drum-fed machines are larger, readily identifiable from a distance, and take more effort to replace.

NASSCO reviewed its expansive list of approved mild steel welding filler material and determined that the lower-nickel varieties proposed in Section 4.1.1 are available for purchase in drums, whereas the higher-nickel types used by NASSCO are not. This presents NASSCO with an opportunity to enforce the utilization of low-nickel welding filler material in the Plate Shop, the production area closest to the fence line, by configuring the space arms to accommodate only drum-fed (and not spool-fed) welding machines and furnishing only drums of low-nickel welding material.

## **4.2 CANCER RISK REDUCTIONS**

As described in Section 2 of this plan, hexavalent chromium and DPM emissions are the primary drivers of the estimated cancer risk from NASSCO's operations. Over the years, NASSCO has implemented EPA-recognized BMPs to reduce welding emissions and made significant facility improvements to electrify many of its processes that otherwise were combustion-based technologies. NASSCO proposes the following additional measures to further reduce hexavalent chromium and DPM emissions as much as feasible.

### **4.2.1 Fume Capture and Filtration at Weld School**

NASSCO has an on-site weld school where employees are certified to perform specific welding operations. The weld school is comprised of a series of 3-sided booths where students learn and demonstrate all welding techniques used in the shipyard. Currently, each booth is equipped with exhaust ventilation hoses ducted to a manifold that uses portable blowers to exhaust the welding fumes away from the worker. Currently, the exhaust system at the weld school does not have a filtration system to reduce emissions. Therefore, NASSCO proposes to acquire and install an exhaust system equipped with HEPA filtration like the system already in use at the Repair Shop for the risk driving welding operations at this location, like stainless steel welding.

NASSCO has begun evaluating the engineering requirements for a new system to optimize the size, location, number of filters, and ventilation flow characteristics for fume capture and control while satisfying ventilation requirements for protecting worker safety.

### **4.2.2 Crane Engine Replacements**

NASSCO will repower Cranes 15 and 16, two of the largest cranes at the shipyard. Although the current whirley crane engines are equipped with DPF and SCR aftertreatment devices to reduce emissions, NASSCO determined that the newest available EPA certified Tier 4F engines for this horsepower rating will result in significantly lower DPM emissions than the existing configuration, even after accounting for the reduction from renewable diesel.

NASSCO expects to purchase the first engine in 2025. Accounting for lead times for manufacturing, permitting, materials, and installation, NASSCO projects a tentative completion date between October 2026 and June 2027. NASSCO expects to purchase the second engine in 2026 and follow a similar timeline, with a tentative completion date in late 2027 to mid-2028.



### 4.3 EMISSION REDUCTION MEASURES FOR FUTURE CONSIDERATION

#### 4.3.1 Welding Operations

In developing this plan, NASSCO evaluated several other potential emissions reduction technologies, particularly for welding, but determined them to be infeasible at this time. One technology evaluated was the use of welding guns equipped with fume extraction tips to pull fumes into a portable filtration system as a welder operates. While promising, these units are cumbersome, as they must be connected to a nearby external fume extraction system that complicates welding in conditions like tight spaces within a ship or in areas that require mobile elevated work platforms (Figure 4-1) that cannot safely accommodate additional equipment. Additionally, this technology can limit the welder's view of the weld, resulting in ergonomic issues and unacceptable weld quality.

Furthermore, NASSCO has not yet identified a feasible combination of welding fume capture and filtration or dust collection that can be operated onboard a ship while meeting ventilation requirements from the Occupational Safety and Health Association and applicable fire safety codes and standards, including those from Navy Standard Items.

**Figure 4-1. Welding on Vessel Hull from Mobile Elevated Work Platforms**



#### 4.3.2 Cranes

The electric cranes at NASSCO have a cabled power connection and move in a limited, predictable range of movement. The diesel whirley cranes run on tracks that cross each other and change direction to support the movement of ship blocks between laydown

areas and the ship's build position. They cannot be physically connected to the power grid due to their sporadic movement patterns throughout the shipyard and no battery technology currently exists that can support their duty cycle. Therefore, installing the cleanest diesel technology available remains the most feasible risk reduction option.

#### **4.3.3 Future Considerations**

While the risk reduction measures described in Sections 4.3.1 and 4.3.2 are not feasible at this time, NASSCO will continue to evaluate the state of technological developments within the domains of welding fume capture and battery technology for possible implementation in shipyard operations as part of the progress reports described in Section 6.

## 5 UPDATED HEALTH RISK ASSESSMENT

Table 5-1 presents a summary of NASSCO’s facility-wide emissions for key risk drivers identified in the 2021 HRA. Table 5-1 also presents cumulative emission reductions associated with risk reduction measures described in Section 4.0 (i.e., welding in SOCs 1-4, a proposed exhaust and HEPA filtration system in the weld school, and whirley cranes engine replacements). The impact to facility-wide emissions associated with this plan is summarized in the last row of this table.

**Table 5-1. Summary of Emissions from Proposed Risk Reduction Measures**

Scenario	DPM (lb/yr)	Nickel (lb/yr)	CrVI (lb/yr)	Arsenic (lb/yr)	Ethylbenzene (lb/yr)	Benzene (lb/hr)	Nickel (lb/hr)
2021 HRA	378.99	113.34	0.47	0.07	24,637	0.103	0.027
Reductions	(216.72)	(35.29)	(0.05)	0.00	0.00	0.00	(0.01)
Proposed	162.27	78.05	0.41	0.07	24,637	0.103	0.021

CrVI – hexavalent chromium

Table 5-2 summarizes estimated MEIR and MEIW risks associated with emissions in Table 5-1.

**Table 5-2. Summary of Estimated Risks from Proposed Risk Reduction Measures**

Scenario	MEIR Cancer	MEIW Cancer	MEIR Chronic HHI	MEIW Chronic HHI	MEIR Acute HHI	MEIW Acute HHI
2021 HRA	28.44	4.96	0.70	1.07	1.19	1.41
Reductions	(6.62)	(0.94)	(0.28)	(0.34)	(0.34)	(0.42)
Proposed	21.82	4.02	0.42	0.73	0.85	0.99

Attachment B includes a summary of emission reductions by device for this plan relative to the approved 2021 emissions inventory. Attachment C includes a list of HRA modeling files for this plan.

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## 6 OVERALL SCHEDULE AND PROGRESS REPORTS

NASSCO will begin implementing welding substitution and operational changes (Section 4.1) to reduce risk upon approval of this plan. The other two proposed measures described in Section 4.2 will require additional time due to cost, engineering, and lead time. Table 6-1 outlines the overall schedule of the proposed Plan. Progress reports are included in the schedule, based on an estimated approved plan.

**Table 6-1. NASSCO 2025 RRAP Overall Schedule**

Measure/Action	Status	Completion Date
RRAP Due Date	Submitted	3/26/2025
RRAP Approval Date	Pending	To be determined
Welding Substitution at SOCs 1 through 4	Execution in progress	6/30/2025
Plate Shop Weld Spool Configuration	Execution in progress	6/30/2025
Initial Progress Report	Proposed	One year after RRAP approval
Weld School Fume Hoods and Control*	Initial Evaluations	3/31/2027
2nd Annual Progress Report	Proposed	Two years after RRAP approval
First Tier 4F Repower of Crane (15 or 16) Engine*	Initial Planning	6/30/2027
3rd Annual Progress Report	Proposed	Three years after RRAP approval
Second Tier 4F Repower of Crane (15 or 16) Engine*	Initial Planning	6/30/2028
4th Annual Progress Report	Proposed	Four years after RRAP approval
Completion of Risk Reduction**	Anticipated	Five years after RRAP approval

\* Actions have potential for delays based on any equipment and material availability, permitting, manufacturer, or other unforeseen circumstances.

\*\* NASSCO will evaluate whether an extension under either Rule 1210 (e)(4) or (e)(5) is needed and submit such request in a timely manner to allow the District time to evaluate pursuant to sections (e)(6) through (e)(8) of Rule 1210.

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## **ATTACHMENTS**

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**Attachment A**  
**General Application Form for RRAP**

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Internal Use Only	
APP ID: APCD20	-APP-
SITE ID: APCD20	-SITE-

**GENERAL PERMIT OR  
REGISTRATION  
APPLICATION FORM**



**Submittal of this application does not grant permission to construct or to operate equipment except as specified in Rule 24(c) or (d)**

**REASON FOR SUBMITTAL OF APPLICATION:**

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> New Installation  | <input type="checkbox"/> Existing Unpermitted Equipment or Rule 11 Change                      | <input type="checkbox"/> Modification of Existing Permitted Equipment                      |
| <input type="checkbox"/> Amendment to Existing Authority to Construct or Application | <input type="checkbox"/> Change of Equipment Location  | <input type="checkbox"/> Change of Equipment Ownership (please provide proof of ownership) |
| <input type="checkbox"/> Change of Permit Conditions                                 | <input type="checkbox"/> Change Permit to Operate Status to Inactive                           | <input type="checkbox"/> Banking Emissions   |
| <input type="checkbox"/> Registration of Portable Equipment                          | <input checked="" type="checkbox"/> Other (Specify) <u>Rule 1210 Risk Reduction Audit Plan</u> |  |

List affected APP/PTO Record ID(s): Not applicable

**APPLICANT INFORMATION**

Name of Business (DBA): General Dynamics NASSCO  
 Does this organization own or operate any other APCD permitted equipment at this or any other adjacent locations?  Yes  No  
 If yes, list assigned Site Record IDs listed on your Permits: APCD1976-SITE-00145  
 Name of Legal Owner (if different from DBA): N/A

Equipment Owner		Authority to Construct Mailing Address	
Name: General Dynamics NASSCO		Name: General Dynamics NASSCO	
Mailing Address: 2798 E. Harbor Drive		Mailing Address: P.O. BOX 85278, MS 22 A	
City: San Diego	State: CA	City: San Diego	State: CA
Zip: 92113	Phone: ( 619 ) 544-7780	Zip: 92186-5278	Phone: ( 619 ) 544-7780
E-Mail Address: andrew.aguilar@nassco.com		E-Mail Address: andrew.aguilar@nassco.com	

Permit To Operate Mailing Address		Invoice Mailing Address	
Name: General Dynamics NASSCO		Name: General Dynamics NASSCO	
Mailing Address: P.O. BOX 85278, MS 22 A		Mailing Address: P.O. BOX 85278, MS 22 A	
City: San Diego	State: CA	City: San Diego	State: CA
Zip: 92186-5278	Phone: ( 619 ) 544-7780	Zip: 92186-5278	Phone: ( 619 ) 544-7780
E-Mail Address: andrew.aguilar@nassco.com		E-Mail Address: andrew.aguilar@nassco.com	

**EQUIPMENT/PROCESS INFORMATION:** Type of Equipment:  Stationary  Portable *If portable, please enter below the equipment storage address.* If portable, will operation exceed 12 consecutive months at the same location  Yes  No

Equipment Location Address: NASSCO at 2798 E. Harbor Drive City: San Diego State: CA  
 Parcel No.: 7600240601 Zip: 92113 Phone: ( 619 ) 544-7780 E-mail: andrew.aguilar@nassco.com  
 Site Contact: Andrew Aguilar, PE, Manager, Environmental Engineering Phone: ( 619 ) 544-7780  
 General Description of Equipment/Process: Rule 1210 Risk Reduction Audit and Plan Addendum associated with the 2021 HRA

Application Submitted by:  Owner  Operator  Contractor  Consultant Affiliation \_\_\_\_\_

**EXPEDITED APPLICATION PROCESSING:**  I hereby request Expedited Application Processing and understand that:

- a) Expedited processing will incur additional fees and permits will not be issued until the additional fees are paid in full (see Rule 40(d)(8)(iv) for details) b) Expedited processing is contingent on the availability of qualified staff c) Once engineering review has begun this request cannot be cancelled d) Expedited processing does not guarantee action by any specific date nor does it guarantee permit approval.

**I hereby certify that all information provided on this application is true and correct.**

SIGNATURE:  Date: 3/25/25  
 Print Name: Andrew Aguilar, PE, Manager, Environmental Engineering Phone: ( 619 ) 544-7780  
 Company: General Dynamics NASSCO E-mail Address: andrew.aguilar@nassco.com

**Internal Use Only**

Date: _____	Staff Initials: _____	Amt Rec'd \$ _____	Fee Schedule: _____
RNP: _____	EMF: _____	NBF: _____	TA: _____

GEN\_APP\_Form\_Rev Date: Feb. 2015



**Attachment B**  
**Emission Reductions for RRAP**

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# Attachment B

## Emission Reductions for RRAP

50% Substitution of High for Low-Nickel Weld Filler Material in SOCs 1-4 + Weld School Filtration				Approved 2021 Emissions Inventory				2025 Risk Reduction Audit and Plan			
				Annual Usage (lb)	Annual Emis (lb/yr)	Max Hrly Usage (lb)	Max Hrly Emis (lb/hr)	Annual Usage (lb)	Annual Emis (lb/yr)	Max Hrly Usage (lb)	Max Hrly Emis (lb/hr)
Device	Description	Material	Chemical								
1000	Welding (NASSCO)	101TC GMAW	Chromium, Hexavalent	30722	0.0025	10.97	0.000001	7596	0.00	2.71	0.000000
1000	Welding (NASSCO)	101TC GMAW	Chromium, Total	30722	0.0504	10.97	0.000018	7596	0.01	2.71	0.000004
1000	Welding (NASSCO)	101TC GMAW	Copper	30722	0.0336	10.97	0.000012	7596	0.01	2.71	0.000003
1000	Welding (NASSCO)	101TC GMAW	Manganese	30722	2.0983	10.97	0.000749	7596	0.52	2.71	0.000185
1000	Welding (NASSCO)	101TC GMAW	Nickel (except nickel oxide)	30722	3.0551	10.97	0.001091	7596	0.76	2.71	0.000270
1000	Welding (NASSCO)	101TC GMAW	Particulate Matter (PM10)	30722	307.2200	10.97	0.109700	7596	75.96	2.71	0.027123
1000	Welding (NASSCO)	101TC GMAW	Total Particulates (TSP)	30722	307.2200	10.97	0.109700	7596	75.96	2.71	0.027123
1000	Welding (NASSCO)	11018 SMAW	Chromium, Hexavalent	120	0.0009	0.04	0.000000	0	0	0	0
1000	Welding (NASSCO)	11018 SMAW	Chromium, Total	120	0.0016	0.04	0.000001	0	0	0	0
1000	Welding (NASSCO)	11018 SMAW	Copper	120	0.0007	0.04	0.000000	0	0	0	0
1000	Welding (NASSCO)	11018 SMAW	Manganese	120	0.0091	0.04	0.000003	0	0	0	0
1000	Welding (NASSCO)	11018 SMAW	Nickel (except nickel oxide)	120	0.0105	0.04	0.000003	0	0	0	0
1000	Welding (NASSCO)	11018 SMAW	Particulate Matter (PM10)	120	1.9680	0.04	0.000656	0	0	0	0
1000	Welding (NASSCO)	11018 SMAW	Total Particulates (TSP)	120	1.9680	0.04	0.000656	0	0	0	0
1000	Welding (NASSCO)	11018 SMAW	Vanadium (fume or dust)	120	0.0001	0.04	0.000000	0	0	0	0
1000	Welding (NASSCO)	309 GMAW	Chromium, Hexavalent	2398	0.1526	0.85	0.000054	2020	0.13	0.72	0.000046
1000	Welding (NASSCO)	309 GMAW	Chromium, Total	2398	3.0529	0.85	0.001082	2020	2.57	0.72	0.000912
1000	Welding (NASSCO)	309 GMAW	Copper	2398	0.0066	0.85	0.000002	2020	0.01	0.72	0.000002
1000	Welding (NASSCO)	309 GMAW	Manganese	2398	0.2070	0.85	0.000073	2020	0.17	0.72	0.000062
1000	Welding (NASSCO)	309 GMAW	Nickel (except nickel oxide)	2398	1.7112	0.85	0.000607	2020	1.44	0.72	0.000511
1000	Welding (NASSCO)	309 GMAW	Particulate Matter (PM10)	2398	23.9800	0.85	0.008500	2020	20.20	0.72	0.007160
1000	Welding (NASSCO)	309 GMAW	Phosphorous	2398	0.0016	0.85	0.000001	2020	0.00	0.72	0.000000
1000	Welding (NASSCO)	309 GMAW	Total Particulates (TSP)	2398	23.9800	0.85	0.008500	2020	20.20	0.72	0.007160
1000	Welding (NASSCO)	71T GMAW	Chromium, Hexavalent	11295	0.0012	4.03	0.000000	411264	0.02	146.74	0.000008
1000	Welding (NASSCO)	71T GMAW	Chromium, Total	11295	0.0247	4.03	0.000009	411264	0.45	146.74	0.000160
1000	Welding (NASSCO)	71T GMAW	Copper	11295	0.0185	4.03	0.000007	411264	0.45	146.74	0.000160
1000	Welding (NASSCO)	71T GMAW	Manganese	11295	0.8332	4.03	0.000297	411264	25.84	146.74	0.009220
1000	Welding (NASSCO)	71T GMAW	Nickel (except nickel oxide)	11295	0.2160	4.03	0.000077	411264	8.76	146.74	0.003127
1000	Welding (NASSCO)	71T GMAW	Particulate Matter (PM10)	11295	112.9500	4.03	0.040300	411264	4112.64	146.74	1.467370
1000	Welding (NASSCO)	71T GMAW	Total Particulates (TSP)	11295	112.9500	4.03	0.040300	411264	4112.64	146.74	1.467370
1000	Welding (NASSCO)	81K GMAW	Aluminum	1069443	0.4090	191	0.000073	626274	0.24	111.85	0.000043
1000	Welding (NASSCO)	81K GMAW	Chromium, Hexavalent	1069443	0.1169	191	0.000021	626274	0.07	111.85	0.000012
1000	Welding (NASSCO)	81K GMAW	Chromium, Total	1069443	2.3374	191	0.000417	626274	1.37	111.85	0.000244
1000	Welding (NASSCO)	81K GMAW	Manganese	1069443	66.6152	191	0.011897	626274	39.01	111.85	0.006967
1000	Welding (NASSCO)	81K GMAW	Nickel (except nickel oxide)	1069443	99.3384	191	0.017742	626274	58.17	111.85	0.010390
1000	Welding (NASSCO)	81K GMAW	Particulate Matter (PM10)	1069443	10694.4300	191	1.910000	626274	6262.74	111.85	1.118511
1000	Welding (NASSCO)	81K GMAW	Phosphorous	1069443	0.4236	191	0.000076	626274	0.25	111.85	0.000044
1000	Welding (NASSCO)	81K GMAW	Total Particulates (TSP)	1069443	10694.4300	191	1.910000	626274	6262.74	111.85	1.118511
1000	Welding (NASSCO)	81K GMAW	Vanadium (fume or dust)	1069443	0.9875	191	0.000176	626274	0.58	111.85	0.000103
1000	Welding (NASSCO)	CU AG BRAZING	Copper	773	31.1133	0.28	0.011270	633	25.48	0.23	0.009229
1000	Welding (NASSCO)	CU AG BRAZING	Particulate Matter (PM10)	773	38.6500	0.28	0.014000	633	31.65	0.23	0.011464
1000	Welding (NASSCO)	CU AG BRAZING	Silver	773	5.6429	0.28	0.002044	633	4.62	0.23	0.001674
1000	Welding (NASSCO)	CU AG BRAZING	Total Particulates (TSP)	773	38.6500	0.28	0.014000	633	31.65	0.23	0.011464
1000	Welding (NASSCO)	RN 67 GTAW	Copper	3564	13.2012	1.27	0.004704	3510	13.00	1.25	0.004633
1000	Welding (NASSCO)	RN 67 GTAW	Lead (inorganic)	3564	0.0006	1.27	0.000000	3510	0.00	1.25	0.000000
1000	Welding (NASSCO)	RN 67 GTAW	Manganese	3564	0.1441	1.27	0.000051	3510	0.14	1.25	0.000051
1000	Welding (NASSCO)	RN 67 GTAW	Nickel (except nickel oxide)	3564	5.9336	1.27	0.002114	3510	5.84	1.25	0.002082
1000	Welding (NASSCO)	RN 67 GTAW	Particulate Matter (PM10)	3564	35.6400	1.27	0.012700	3510	35.10	1.25	0.012508
1000	Welding (NASSCO)	RN 67 GTAW	Phosphorous	3564	0.0006	1.27	0.000000	3510	0.00	1.25	0.000000
1000	Welding (NASSCO)	RN 67 GTAW	Total Particulates (TSP)	3564	35.6400	1.27	0.012700	3510	35.10	1.25	0.012508

# Attachment B

## Emission Reductions for RRAP

Proposed Weld School Exhaust and HEPA Filtration System				Approved 2021 Emissions Inventory				2025 Risk Reduction Audit and Plan			
				Annual Usage (lb)	Annual Emis (lb/yr)	Max Hrly Usage (lb)	Max Hrly Emis (lb/hr)	Annual Usage (lb)	Annual Emis (lb/yr)	Max Hrly Usage (lb)	Max Hrly Emis (lb/hr)
Device	Description	Material	Chemical								
TBD	Weld School Filter	101TC GMAW	Chromium, Hexavalent	0	0	0	0	23126	3.79E-09	8.26	1.35E-12
TBD	Weld School Filter	101TC GMAW	Chromium, Total	0	0	0	0	23126	7.58E-08	8.26	2.71E-11
TBD	Weld School Filter	101TC GMAW	Copper	0	0	0	0	23126	5.05E-08	8.26	1.80E-11
TBD	Weld School Filter	101TC GMAW	Manganese	0	0	0	0	23126	3.16E-06	8.26	1.13E-09
TBD	Weld School Filter	101TC GMAW	Nickel (except nickel oxide)	0	0	0	0	23126	4.60E-06	8.26	1.64E-09
TBD	Weld School Filter	101TC GMAW	Particulate Matter (PM10)	0	0	0	0	23126	4.63E-04	8.26	1.65E-07
TBD	Weld School Filter	101TC GMAW	Total Particulates (TSP)	0	0	0	0	23126	4.63E-04	8.26	1.65E-07
TBD	Weld School Filter	11018 SMAW	Chromium, Hexavalent	0	0	0	0	120	1.74E-09	0.04	5.79E-13
TBD	Weld School Filter	11018 SMAW	Chromium, Total	0	0	0	0	120	3.16E-09	0.04	1.05E-12
TBD	Weld School Filter	11018 SMAW	Copper	0	0	0	0	120	1.35E-09	0.04	4.51E-13
TBD	Weld School Filter	11018 SMAW	Manganese	0	0	0	0	120	1.82E-08	0.04	6.05E-12
TBD	Weld School Filter	11018 SMAW	Nickel (except nickel oxide)	0	0	0	0	120	2.10E-08	0.04	6.99E-12
TBD	Weld School Filter	11018 SMAW	Particulate Matter (PM10)	0	0	0	0	120	3.94E-06	0.04	1.31E-09
TBD	Weld School Filter	11018 SMAW	Total Particulates (TSP)	0	0	0	0	120	3.94E-06	0.04	1.31E-09
TBD	Weld School Filter	11018 SMAW	Vanadium (fume or dust)	0	0	0	0	120	1.13E-10	0.04	3.76E-14
TBD	Weld School Filter	309 GMAW	Chromium, Hexavalent	0	0	0	0	378	4.81E-08	0.13	1.71E-11
TBD	Weld School Filter	309 GMAW	Chromium, Total	0	0	0	0	378	9.62E-07	0.13	3.41E-10
TBD	Weld School Filter	309 GMAW	Copper	0	0	0	0	378	2.07E-09	0.13	7.32E-13
TBD	Weld School Filter	309 GMAW	Manganese	0	0	0	0	378	6.53E-08	0.13	2.31E-11
TBD	Weld School Filter	309 GMAW	Nickel (except nickel oxide)	0	0	0	0	378	5.39E-07	0.13	1.91E-10
TBD	Weld School Filter	309 GMAW	Particulate Matter (PM10)	0	0	0	0	378	7.56E-06	0.13	2.68E-09
TBD	Weld School Filter	309 GMAW	Phosphorous	0	0	0	0	378	4.96E-10	0.13	1.76E-13
TBD	Weld School Filter	309 GMAW	Total Particulates (TSP)	0	0	0	0	378	7.56E-06	0.13	2.68E-09
TBD	Weld School Filter	CU AG BRAZING	Copper	0	0	0	0	140	1.13E-05	0.05	4.08E-09
TBD	Weld School Filter	CU AG BRAZING	Particulate Matter (PM10)	0	0	0	0	140	1.40E-05	0.05	5.07E-09
TBD	Weld School Filter	CU AG BRAZING	Silver	0	0	0	0	140	2.04E-06	0.05	7.40E-10
TBD	Weld School Filter	CU AG BRAZING	Total Particulates (TSP)	0	0	0	0	140	1.40E-05	0.05	5.07E-09
TBD	Weld School Filter	RN 67 GTAW	Copper	0	0	0	0	54	4.00E-07	0.02	1.43E-10
TBD	Weld School Filter	RN 67 GTAW	Lead (inorganic)	0	0	0	0	54	1.77E-11	0.02	6.31E-15
TBD	Weld School Filter	RN 67 GTAW	Manganese	0	0	0	0	54	4.37E-09	0.02	1.56E-12
TBD	Weld School Filter	RN 67 GTAW	Nickel (except nickel oxide)	0	0	0	0	54	1.80E-07	0.02	6.41E-11
TBD	Weld School Filter	RN 67 GTAW	Particulate Matter (PM10)	0	0	0	0	54	1.08E-06	0.02	3.85E-10
TBD	Weld School Filter	RN 67 GTAW	Phosphorous	0	0	0	0	54	1.77E-11	0.02	6.31E-15
TBD	Weld School Filter	RN 67 GTAW	Total Particulates (TSP)	0	0	0	0	54	1.08E-06	0.02	3.85E-10
TBD	Weld School Filter	81K GMAW	Aluminum	0	0	0	0	43200	3.30E-08	7.72	5.90E-12
TBD	Weld School Filter	81K GMAW	Chromium, Hexavalent	0	0	0	0	43200	9.44E-09	7.72	1.69E-12
TBD	Weld School Filter	81K GMAW	Chromium, Total	0	0	0	0	43200	1.89E-07	7.72	3.37E-11
TBD	Weld School Filter	81K GMAW	Manganese	0	0	0	0	43200	5.38E-06	7.72	9.61E-10
TBD	Weld School Filter	81K GMAW	Nickel (except nickel oxide)	0	0	0	0	43200	8.07E-06	7.72	1.44E-09
TBD	Weld School Filter	81K GMAW	Particulate Matter (PM10)	0	0	0	0	43200	8.64E-04	7.72	1.54E-07
TBD	Weld School Filter	81K GMAW	Phosphorous	0	0	0	0	43200	3.42E-08	7.72	6.11E-12
TBD	Weld School Filter	81K GMAW	Total Particulates (TSP)	0	0	0	0	43200	8.64E-04	7.72	1.54E-07
TBD	Weld School Filter	81K GMAW	Vanadium (fume or dust)	0	0	0	0	43200	7.98E-08	7.72	1.42E-11



# Attachment B

## Emission Reductions for RRAP

Repower Cranes 15 and 16 with Tier 4F Engines + Use of Renewable Diesel (benefit to non-Tier T4 Engines)				Approved 2021 Emissions Inventory				2025 Risk Reduction Audit and Plan			
				Annual Usage (gal)	Annual Emis (lb/yr)	Max Hrly Usage (gal)	Max Hrly Emis (lb/hr)	Annual Usage (gal)	Annual Emis (lb/yr)	Max Hrly Usage (gal)	Max Hrly Emis (lb/hr)
Device	Description	Material	Chemical								
921303	Crane #14	DIESEL	Diesel Particulate	64677	26.5176	23.6	0.0097	64677	18.7331	23.6	0.0068
921303	Crane #14	DIESEL	Arsenic (inorganic)	64677	0	23.6	0.0000	64677	0	23.6	0.0000
921303	Crane #14	DIESEL	Cadmium	64677	0	23.6	0.0000	64677	0	23.6	0.0000
921303	Crane #14	DIESEL	Chromium, Hexavalent	64677	0	23.6	0.0000	64677	0	23.6	0.0000
921303	Crane #14	DIESEL	Chromium, Non-Hexavalent	64677	0	23.6	0.0000	64677	0	23.6	0.0000
921303	Crane #14	DIESEL	Copper	64677	0	23.6	0.0001	64677	0	23.6	0.0001
921303	Crane #14	DIESEL	Lead (inorganic)	64677	0	23.6	0.0002	64677	0	23.6	0.0001
921303	Crane #14	DIESEL	Manganese	64677	0	23.6	0.0001	64677	0	23.6	0.0001
921303	Crane #14	DIESEL	Mercury (inorganic)	64677	0	23.6	0.0000	64677	0	23.6	0.0000
921303	Crane #14	DIESEL	Nickel (except nickel oxide)	64677	0	23.6	0.0001	64677	0	23.6	0.0001
921303	Crane #14	DIESEL	Selenium	64677	0	23.6	0.0001	64677	0	23.6	0.0000
921303	Crane #14	DIESEL	Zinc	64677	0	23.6	0.0005	64677	0	23.6	0.0004
950704	Crane #11	DIESEL	Diesel Particulate	27177	28.2641	17.5	0.0182	27177	8.6586	17.5	0.0056
950704	Crane #11	DIESEL	Arsenic (inorganic)	27177	0	17.5	0.0000	27177	0	17.5	0.0000
950704	Crane #11	DIESEL	Cadmium	27177	0	17.5	0.0000	27177	0	17.5	0.0000
950704	Crane #11	DIESEL	Chromium, Hexavalent	27177	0	17.5	0.0000	27177	0	17.5	0.0000
950704	Crane #11	DIESEL	Chromium, Non-Hexavalent	27177	0	17.5	0.0000	27177	0	17.5	0.0000
950704	Crane #11	DIESEL	Copper	27177	0	17.5	0.0001	27177	0	17.5	0.0000
950704	Crane #11	DIESEL	Lead (inorganic)	27177	0	17.5	0.0001	27177	0	17.5	0.0000
950704	Crane #11	DIESEL	Manganese	27177	0	17.5	0.0001	27177	0	17.5	0.0000
950704	Crane #11	DIESEL	Mercury (inorganic)	27177	0	17.5	0.0000	27177	0	17.5	0.0000
950704	Crane #11	DIESEL	Nickel (except nickel oxide)	27177	0	17.5	0.0001	27177	0	17.5	0.0000
950704	Crane #11	DIESEL	Selenium	27177	0	17.5	0.0000	27177	0	17.5	0.0000
950704	Crane #11	DIESEL	Zinc	27177	0	17.5	0.0004	27177	0	17.5	0.0001
950705	Crane #10	DIESEL	Diesel Particulate	25978	65.4646	17.5	0.0441	25978	8.2766	17.5	0.0056
950705	Crane #10	DIESEL	Arsenic (inorganic)	25978	0	17.5	0.0000	25978	0	17.5	0.0000
950705	Crane #10	DIESEL	Cadmium	25978	0	17.5	0.0000	25978	0	17.5	0.0000
950705	Crane #10	DIESEL	Chromium, Hexavalent	25978	0	17.5	0.0000	25978	0	17.5	0.0000
950705	Crane #10	DIESEL	Chromium, Non-Hexavalent	25978	0	17.5	0.0000	25978	0	17.5	0.0000
950705	Crane #10	DIESEL	Copper	25978	0	17.5	0.0001	25978	0	17.5	0.0000
950705	Crane #10	DIESEL	Lead (inorganic)	25978	0	17.5	0.0001	25978	0	17.5	0.0000
950705	Crane #10	DIESEL	Manganese	25978	0	17.5	0.0001	25978	0	17.5	0.0000
950705	Crane #10	DIESEL	Mercury (inorganic)	25978	0	17.5	0.0000	25978	0	17.5	0.0000
950705	Crane #10	DIESEL	Nickel (except nickel oxide)	25978	0	17.5	0.0001	25978	0	17.5	0.0000
950705	Crane #10	DIESEL	Selenium	25978	0	17.5	0.0000	25978	0	17.5	0.0000
950705	Crane #10	DIESEL	Zinc	25978	0	17.5	0.0004	25978	0	17.5	0.0000
950706	Crane #12	DIESEL	Diesel Particulate	64715	17.4731	23.6	0.0064	64715	12.2244	23.6	0.0045
950706	Crane #12	DIESEL	Arsenic (inorganic)	64715	0	23.6	0.0000	64715	0	23.6	0.0000
950706	Crane #12	DIESEL	Cadmium	64715	0	23.6	0.0000	64715	0	23.6	0.0000
950706	Crane #12	DIESEL	Chromium, Hexavalent	64715	0	23.6	0.0000	64715	0	23.6	0.0000
950706	Crane #12	DIESEL	Chromium, Non-Hexavalent	64715	0	23.6	0.0000	64715	0	23.6	0.0000
950706	Crane #12	DIESEL	Copper	64715	0	23.6	0.0001	64715	0	23.6	0.0001
950706	Crane #12	DIESEL	Lead (inorganic)	64715	0	23.6	0.0002	64715	0	23.6	0.0001
950706	Crane #12	DIESEL	Manganese	64715	0	23.6	0.0001	64715	0	23.6	0.0001
950706	Crane #12	DIESEL	Mercury (inorganic)	64715	0	23.6	0.0000	64715	0	23.6	0.0000
950706	Crane #12	DIESEL	Nickel (except nickel oxide)	64715	0	23.6	0.0001	64715	0	23.6	0.0001
950706	Crane #12	DIESEL	Selenium	64715	0	23.6	0.0001	64715	0	23.6	0.0000
950706	Crane #12	DIESEL	Zinc	64715	0	23.6	0.0005	64715	0	23.6	0.0004

# Attachment B

## Emission Reductions for RRAP

Repower Cranes 15 and 16 with Tier 4F Engines + Use of Renewable Diesel (benefit to non-Tier T4 Engines)				Approved 2021 Emissions Inventory				2025 Risk Reduction Audit and Plan			
				Annual Usage (gal)	Annual Emis (lb/yr)	Max Hrly Usage (gal)	Max Hrly Emis (lb/hr)	Annual Usage (gal)	Annual Emis (lb/yr)	Max Hrly Usage (gal)	Max Hrly Emis (lb/hr)
Device	Description	Material	Chemical								
961422	Crane #8	DIESEL	Diesel Particulate	20646	17.9620	10	0.0087	20646	12.5720	10	0.0061
961422	Crane #8	DIESEL	Arsenic (inorganic)	20646	0	10	0.0000	20646	0	10	0.0000
961422	Crane #8	DIESEL	Cadmium	20646	0	10	0.0000	20646	0	10	0.0000
961422	Crane #8	DIESEL	Chromium, Hexavalent	20646	0	10	0.0000	20646	0	10	0.0000
961422	Crane #8	DIESEL	Chromium, Non-Hexavalent	20646	0	10	0.0000	20646	0	10	0.0000
961422	Crane #8	DIESEL	Copper	20646	0	10	0.0000	20646	0	10	0.0000
961422	Crane #8	DIESEL	Lead (inorganic)	20646	0	10	0.0001	20646	0	10	0.0001
961422	Crane #8	DIESEL	Manganese	20646	0	10	0.0000	20646	0	10	0.0000
961422	Crane #8	DIESEL	Mercury (inorganic)	20646	0	10	0.0000	20646	0	10	0.0000
961422	Crane #8	DIESEL	Nickel (except nickel oxide)	20646	0	10	0.0000	20646	0	10	0.0000
961422	Crane #8	DIESEL	Selenium	20646	0	10	0.0000	20646	0	10	0.0000
961422	Crane #8	DIESEL	Zinc	20646	0	10	0.0002	20646	0	10	0.0002
961424	Crane #9	DIESEL	Diesel Particulate	21896	10.5101	10	0.0048	21896	7.2830	10	0.0033
961424	Crane #9	DIESEL	Arsenic (inorganic)	21896	0	10	0.0000	21896	0	10	0.0000
961424	Crane #9	DIESEL	Cadmium	21896	0	10	0.0000	21896	0	10	0.0000
961424	Crane #9	DIESEL	Chromium, Hexavalent	21896	0	10	0.0000	21896	0	10	0.0000
961424	Crane #9	DIESEL	Chromium, Non-Hexavalent	21896	0	10	0.0000	21896	0	10	0.0000
961424	Crane #9	DIESEL	Copper	21896	0	10	0.0000	21896	0	10	0.0000
961424	Crane #9	DIESEL	Lead (inorganic)	21896	0	10	0.0001	21896	0	10	0.0001
961424	Crane #9	DIESEL	Manganese	21896	0	10	0.0000	21896	0	10	0.0000
961424	Crane #9	DIESEL	Mercury (inorganic)	21896	0	10	0.0000	21896	0	10	0.0000
961424	Crane #9	DIESEL	Nickel (except nickel oxide)	21896	0	10	0.0000	21896	0	10	0.0000
961424	Crane #9	DIESEL	Selenium	21896	0	10	0.0000	21896	0	10	0.0000
961424	Crane #9	DIESEL	Zinc	21896	0	10	0.0002	21896	0	10	0.0002
961425	Crane #7	DIESEL	Diesel Particulate	16830	8.0784	10.2	0.0049	16830	5.5980	10.2	0.0034
961425	Crane #7	DIESEL	Arsenic (inorganic)	16830	0	10.2	0.0000	16830	0	10.2	0.0000
961425	Crane #7	DIESEL	Cadmium	16830	0	10.2	0.0000	16830	0	10.2	0.0000
961425	Crane #7	DIESEL	Chromium, Hexavalent	16830	0	10.2	0.0000	16830	0	10.2	0.0000
961425	Crane #7	DIESEL	Chromium, Non-Hexavalent	16830	0	10.2	0.0000	16830	0	10.2	0.0000
961425	Crane #7	DIESEL	Copper	16830	0	10.2	0.0000	16830	0	10.2	0.0000
961425	Crane #7	DIESEL	Lead (inorganic)	16830	0	10.2	0.0001	16830	0	10.2	0.0001
961425	Crane #7	DIESEL	Manganese	16830	0	10.2	0.0000	16830	0	10.2	0.0000
961425	Crane #7	DIESEL	Mercury (inorganic)	16830	0	10.2	0.0000	16830	0	10.2	0.0000
961425	Crane #7	DIESEL	Nickel (except nickel oxide)	16830	0	10.2	0.0000	16830	0	10.2	0.0000
961425	Crane #7	DIESEL	Selenium	16830	0	10.2	0.0000	16830	0	10.2	0.0000
961425	Crane #7	DIESEL	Zinc	16830	0	10.2	0.0002	16830	0	10.2	0.0002
975360	Crane #15	DIESEL	Diesel Particulate	75701	85.5421	34.3	0.0388	75701	23.9801	34.3	0.0109
975360	Crane #15	DIESEL	Arsenic (inorganic)	75701	0	34.3	0.0001	75701	0	34.3	0.0000
975360	Crane #15	DIESEL	Cadmium	75701	0	34.3	0.0001	75701	0	34.3	0.0000
975360	Crane #15	DIESEL	Chromium, Hexavalent	75701	0	34.3	0.0000	75701	0	34.3	0.0000
975360	Crane #15	DIESEL	Chromium, Non-Hexavalent	75701	0	34.3	0.0000	75701	0	34.3	0.0000
975360	Crane #15	DIESEL	Copper	75701	0	34.3	0.0001	75701	0	34.3	0.0000
975360	Crane #15	DIESEL	Lead (inorganic)	75701	0	34.3	0.0003	75701	0	34.3	0.0001
975360	Crane #15	DIESEL	Manganese	75701	0	34.3	0.0001	75701	0	34.3	0.0000
975360	Crane #15	DIESEL	Mercury (inorganic)	75701	0	34.3	0.0001	75701	0	34.3	0.0000
975360	Crane #15	DIESEL	Nickel (except nickel oxide)	75701	0	34.3	0.0001	75701	0	34.3	0.0000
975360	Crane #15	DIESEL	Selenium	75701	0	34.3	0.0001	75701	0	34.3	0.0000
975360	Crane #15	DIESEL	Zinc	75701	0	34.3	0.0008	75701	0	34.3	0.0002

## Attachment B Emission Reductions for RRAP

Repower Cranes 15 and 16 with Tier 4F Engines + Use of Renewable Diesel (benefit to non-Tier T4 Engines)				Approved 2021 Emissions Inventory				2025 Risk Reduction Audit and Plan			
				Annual Usage (gal)	Annual Emis (lb/yr)	Max Hrly Usage (gal)	Max Hrly Emis (lb/hr)	Annual Usage (gal)	Annual Emis (lb/yr)	Max Hrly Usage (gal)	Max Hrly Emis (lb/hr)
Device	Description	Material	Chemical								
975361	Crane #16	DIESEL	Diesel Particulate	72965	77.3429	34.3	0.0364	72965	23.1134	34.3	0.0109
975361	Crane #16	DIESEL	Arsenic (inorganic)	72965	0	34.3	0.0001	72965	0	34.3	0.0000
975361	Crane #16	DIESEL	Cadmium	72965	0	34.3	0.0001	72965	0	34.3	0.0000
975361	Crane #16	DIESEL	Chromium, Hexavalent	72965	0	34.3	0.0000	72965	0	34.3	0.0000
975361	Crane #16	DIESEL	Chromium, Non-Hexavalent	72965	0	34.3	0.0000	72965	0	34.3	0.0000
975361	Crane #16	DIESEL	Copper	72965	0	34.3	0.0001	72965	0	34.3	0.0000
975361	Crane #16	DIESEL	Lead (inorganic)	72965	0	34.3	0.0003	72965	0	34.3	0.0001
975361	Crane #16	DIESEL	Manganese	72965	0	34.3	0.0001	72965	0	34.3	0.0000
975361	Crane #16	DIESEL	Mercury (inorganic)	72965	0	34.3	0.0001	72965	0	34.3	0.0000
975361	Crane #16	DIESEL	Nickel (except nickel oxide)	72965	0	34.3	0.0001	72965	0	34.3	0.0000
975361	Crane #16	DIESEL	Selenium	72965	0	34.3	0.0001	72965	0	34.3	0.0000
975361	Crane #16	DIESEL	Zinc	72965	0	34.3	0.0008	72965	0	34.3	0.0002

Chemicals Contributing to Risk Reductions, Subtotals		Approved 2021 Emissions Inventory		2025 Risk Reduction Audit and Plan	
		Annual Emis (lb/yr)	Max Hrly Emis (lb/hr)	Annual Emis (lb/yr)	Max Hrly Emis (lb/hr)
Chemical					
Diesel Particulate		337.15	0.1719	120.44	0.0570
Nickel (except nickel oxide)		110.26	0.0223	74.98	0.0167
Chromium, Hexavalent		0.27	0.0001	0.22	0.0001
Arsenic (inorganic)		0	0.0003	0	0.0001
Ethyl Benzene		0	0.0020	0	0.0020
Benzene		0	0.0337	0	0.0337

Chemicals Contributing to Risk Reductions, Net Changes		2025 RRAP Total Reductions	
		Annual Emis (lb/yr)	Max Hrly Emis (lb/hr)
Chemical			
Diesel Particulate		(216.72)	(0.1149)
Nickel (except nickel oxide)		(35.29)	(0.0056)
Chromium, Hexavalent		(0.05)	(0.00002)
Arsenic (inorganic)		0	(0.0002)
Ethyl Benzene		0	0
Benzene		0	0

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**Attachment C**  
**HRA Modeling Files for RRAP**

**(Provided to the District in Electronic Format)**

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