DRAFT PERMIT TO OPERATE ADDENDUM
TO ENGINEERING EVALUATION REPORT
SCHNITZER STEEL PRODUCTS COMPANY
PLANT NUMBER 208
APPLICATION NUMBER 30009

September 2024

I. EXECUTIVE SUMMARY

The Bay Area Air Quality Management District (Air District) took enforcement action in 2020 to require Schnitzer Steel Products Company (Schnitzer) to install additional air pollution control equipment on its Metal Shredder at its facility in West Oakland.[1] This additional air pollution control equipment, which Schnitzer installed in 2022, was designed to reduce the facility's potential to emit smog-forming Precursor Organic Compounds (POC) by over 232 tons per year – from 236.7 tons per year to just 3.9 tons per year – and bring Schnitzer's emissions into compliance with Air District regulations. The new abatement equipment has also greatly reduced health risks for those living near the facility. It has reduced cancer risk by 74%, and it has reduced exposures to non-cancer compounds with long-term (chronic) health effects by 36% and exposures to non-cancer compounds with short-term (acute) health effects by 65%.

Schnitzer installed the new abatement equipment pursuant to an Authority to Construct issued by the Air District under Permit Application No. 30009, which authorized installation and initial operation of the equipment. The Authority to Construct and related Air District regulations required Schnitzer to conduct startup emissions testing to confirm that the equipment is operating in compliance with the emission limits specified in the Air District's permit conditions and with assumptions used in emission calculations. The Air District has prepared this document – an Addendum to the Engineering Evaluation Report prepared in connection with the Authority to Construct – to summarize the results of the startup emissions testing.

Based on the results of the startup emissions testing, and on additional analysis as described below, the Air District is now proposing to issue a Permit to Operate for the new pollution control equipment. The Permit to Operate will authorize continued operation of the abatement equipment going forward. In addition, the Air District is proposing a number of changes to permit conditions for the shredder and its associated control equipment to improve parametric monitoring, recordkeeping and compliance. Lastly, the Air District has added a discussion of civil rights and environmental justice considerations in this Addendum.

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[1] See Air District Notice of Violation No. A57682. In 2021, the California Attorney General, along with the Department of Toxic Substances Control and the Alameda County District Attorney, took a similar enforcement action requiring Schnitzer to install this abatement equipment. See *People v. Schnitzer Steel Industries, Inc.* (Alameda County Superior Court Case No. RG21087468).

Note also that Schnitzer Steel Products Company has recently changed its name to Radius Recycling. For consistency with prior documents, this Addendum continues to use the Schnitzer name for this permit.

Startup Emissions Testing:

Startup emissions testing showed that the new air pollution control equipment is operating in compliance with the emissions performance standards that were contemplated when the Air District issued the Authority to Construct, with a few exceptions. Startup emissions testing revealed that the feedstock Schnitzer processes in the Metal Shredder contains nitrogen compounds, which generate oxides of nitrogen (NOx) when emissions from the Shredder are abated in the pollution control equipment. Under Air District regulations, Schnitzer is required to abate these NOx emissions using a level of emissions control technology known as "Reasonably Available Control Technology," or "RACT". The Air District has evaluated what this level of emissions control requires for Schnitzer's operation, and it has determined that the equipment's current NOx emissions comply with this RACT emissions control standard. The Air District is imposing additional NOx emission limits in the Permit to Operate to ensure that these feedstock-generated NOx emissions comply with this RACT requirement in a legally enforceable manner. The Air District is retaining the original 50 lb/MMscf NOx emission limits for NOx generated by the new pollution control equipment itself, with which the equipment is in compliance as demonstrated by the startup emissions testing. The Air District is adding additional permit limits that will apply to the combined NOx emissions from the control equipment and NOx emissions generated from the shredder feed. These limits are specified in Condition #27348, Part 10. Emissions testing showed that the shredder and the new control equipment will comply with all limits in Part 10. To ensure ongoing compliance, the Air District is requiring more frequent emissions testing of NOx emissions. Condition #27348, Part 12, increases the testing frequency of NOx emissions from annual to quarterly testing for at least two years. If continued compliance is demonstrated with a high margin of compliance, testing frequency may be reduced to usual annual frequency.

Testing for Toxic Air Contaminants (TACs) confirmed that the new abatement equipment was achieving significant emission reductions. Emissions of three TACs (1,3-butadiene, arsenic, and polychlorinated biphenyls or PCBs) were not as low as initially anticipated, however. The Air District therefore conducted an updated health risk assessment (HRA) based on the TAC emissions rates observed during the testing, which found significant overall reductions for each type of health impact compared to the pre-project scenario. Based on these test results and subsequent analysis, the Air District is proposing to expand the list of toxic air contaminants that will be monitored during future testing, amend the hourly limits for these compounds, and remove alternative actions to meeting these limits. These proposed revisions are in Condition #27348, Part 11. In Condition #27410, Part 4, the Air District is proposing to increase the monitoring frequency for toxic air contaminants.

Other Proposed Permit Condition Changes:

The metal shredder is housed within an enclosure that helps prevent "fugitive" TAC emissions by capturing emissions and routing them to the abatement equipment. The shredder enclosure is

designed to capture at least 95% of these TAC emissions. In Condition # 27410, Part 2, the Air District is proposing to improve operating requirements for the enclosure by requiring that Schnitzer follow an operating and maintenance plan for the shredder enclosure, which includes closure of specific openings, inspection and maintenance of the enclosure and curtains, and record keeping for all monitoring, inspection, and repair events. The Air District is also proposing to add pressure drop monitoring during shredder operation to assure on-going compliance with the Air District's inferred minimum enclosure capture efficiency of 95%.

Emissions testing demonstrated that the venturi scrubbers that are upstream of the new abatement systems can achieve compliance with particulate matter limits at a lower water flow rate. The Air District therefore is proposing to adjust the minimum water flow rate requirement (see Condition #27410, Part 3). This proposed change will not have an effect on emissions limits or Schnitzer's compliance with applicable regulatory requirements.

The Air District is proposing to increase the minimum operating temperature for the thermal oxidizers and to expand the operating temperature range for thermocouples measuring this temperature. This proposed change is intended to ensure on-going compliance with POC destruction efficiency requirements and TAC emission limits.

Finally, the Air District is proposing to add appropriate averaging times for parametric monitoring limits, such as fan amperes and minimum water flow rates and adding language to allow adjustment of parametric monitoring limits based on District approved source test results when needed to assure compliance with applicable emission limits.

These proposed permit conditions changes are discussed in more detail later in this report.

Additional Considerations:

Due to the changes in emissions proposed by this draft Permit to Operate decision, the Air District has reconsidered the potential impacts from this project on the surrounding environment pursuant to the California Environmental Quality Act (CEQA). The Air District has concluded that this project will not have any significant impacts and there is no need to consider alternatives or mitigation measures beyond what the Air District is imposing anyway under its own regulations.

The Air District has also included a discussion of civil rights and environmental justice considerations in this Addendum. The Schnitzer facility is located in West Oakland, where civil rights and environmental justice concerns are an important consideration due to the higher proportion of Black residents and higher pollution levels compared to the greater Bay Area. This proposed permitting decision would be consistent with civil rights law and environmental justice principles because, among other reasons, the abatement equipment that is the subject of the proposed permit is benefitting the surrounding community by reducing emissions from Schnitzer's facility. Although the installation of the abatement equipment has resulted in some incidental

emission increases, any potential adverse impacts are far outweighed by the positive impacts and would be mitigated.

Proposal to Issue Permit to Operate for the New Abatement Equipment:

Under the Air District's permitting regulations, a permit applicant is required to obtain an Authority to Construct to authorize construction and initial operation of a project, and then it is required to obtain a Permit to Operate based on startup emissions testing to authorize continued operation going forward.

Based on these analyses establishing that the new pollution control equipment Schnitzer has installed is in compliance with Air District regulatory and permitting standards, the Air District is now proposing to issue the Permit to Operate for the equipment, with additional and revised permit conditions as outlined above. This addendum discusses the test results and the basis for the permit condition revisions in more detail. The revised permit conditions are provided at the end of this addendum, showing the changes in underline/~~strikeout~~ format.

The Air District is issuing this Addendum to invite public comment on the proposal to issue the Permit to Operate. The Air District will consider and incorporate comments before taking any final action on permit issuance.

II. AUTHORITY TO CONSTRUCT FOR SCHNITZER'S NEW AIR POLLUTION CONTROL EQUIPMENT

The Air District issued an Authority to Construct to Schnitzer on August 26, 2021, authorizing Schnitzer to install two Regenerative Thermal Oxidizers and two Packed Bed Scrubbers on its Metal Shredder. Specifically, the Authority to Construct authorized Schnitzer to install the following pollution control equipment on the Metal Shredder (Source S-6):

A-15 Regenerative Thermal Oxidizer, 21 MMBTU/hr

A-16 Regenerative Thermal Oxidizer, 21 MMBTU/hr

A-17 Packed Bed Scrubber, abating A-15

A-18 Packed Bed Scrubber, abating A-16

Schnitzer sought to install this abatement equipment to control emissions of Precursor Organic Compounds (POC) that are generated by the metal shredder. POC is a precursor pollutant that combines with NOx in the atmosphere to form tropospheric ozone, the principal ingredient in regional smog. Air District regulations restrict the amount of POC that can be emitted from Schnitzer's facility, and the Regenerative Thermal Oxidizers (RTOs) are necessary to control emissions to compliant levels. The packed bed scrubbers are necessary to remove any acid gases that may form in the RTOs. A more detailed description of the equipment is provided in Section II of the Engineering Evaluation for the project.

Under Air District regulations, an Authority to Construct allows a facility to install the equipment and operate it for a limited startup period, during which the facility is required to test the equipment to demonstrate that it has been installed in compliance with the Authority to Construct and is complying with applicable permit conditions. (*See* Air Dist. Regulations 2-1-210 & 2-1-411.) The Air District reviews the results of the startup emissions testing (among other information) to confirm compliance. Once the facility demonstrates that it has installed the equipment and is operating it in compliance with applicable permit conditions, the Air District issues a Permit to Operate to authorize continued operation going forward. (*See* Air Dist. Regulations 2-1-411.) The Permit to Operate is subsequently renewed annually.

After receiving its Authority to Construct in August of 2021,[2] Schnitzer installed the new pollution control equipment and began operating it in April of 2022. Schnitzer conducted startup emissions testing in April, July, and October 2022.[3] Testing included:

- Testing of the abatement equipment's POC destruction efficiency to confirm compliance with the requirement in Condition #27348, Part 2;
- Testing of CO and NOx emissions to confirm compliance with the limits in Condition #27348, Part 10;
- Testing of PM and POC limits to confirm compliance with the limits in Condition #27410, Part 3; and,
- Testing of Toxic Air Contaminant (TAC) emissions in accordance with Condition #27348, Part 11, to confirm that actual TAC emissions are consistent with the assumptions the Air District used in its Health Risk Assessment prepared for the Authority to Construct.

The results of this testing are discussed below.

III. RESULTS OF STARTUP EMISSIONS TESTING

The startup emissions testing has ultimately confirmed that Schnitzer's new air pollution control equipment is operating in compliance with applicable Air District regulatory standards. In some cases, certain adjustments were necessary to get the equipment operating properly, and in one case (with NOx) a new permit limit will be required to address an unanticipated source of NOx emissions and ensure that the emissions remain compliant with Air District regulations. The following discussion provides a detailed overview of the emissions testing results and how Schnitzer has demonstrated compliance with applicable regulatory requirements.

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[2] After initial issuance of the Authority to Construct, the Air District issued a revision on March 2, 2022, that amended certain permit conditions to clarify operating and monitoring requirements and correct errors.

[3] (i) BAAQMD, Interoffice Memorandum, November 3, 2022: Outside Test CST-10028; April 26 thru 29, 2022, source test of S-6 for Schnitzer Steel (Oakland, CA), Plant #208, Application #30009; (ii) BAAQMD, Interoffice Memorandum, September 29, 2022: Outside Test CST-10032; July 14 & 15, 2022, source test of S-6 for Schnitzer Steel (Oakland, CA), Plant #208, Application #30009; (iii) BAAQMD, Interoffice Memorandum, December 7, 2022: Outside Test CST-10051; October 4 thru 5, 2022, source test of S-6 for Schnitzer Steel (Oakland, CA), Plant #208, Application #30009.

A. POC Emissions:

Emissions testing conducted April 26-29, 2022, showed that each RTO met all applicable emission limits for organic compounds, including (i) the total carbon emission limits in Air District Regulation 8-2-301; (ii) the volatile organic compound (VOC) destruction efficiency requirement in Condition #27348, Part 2; and (iii) the POC limits in Condition #27410, Part 3. Subsequent testing in October 2022 also demonstrated compliance with all applicable organic emission limits. Organic emissions were less than 53% of the permit condition limits and less than 3% of the Regulation 8, Rule 2 emission limit. These test results confirm that the RTOs are working as intended to achieve very significant POC emission reductions from Schnitzer's facility and to bring the facility into compliance with applicable Air District regulations. Results from the April and October tests are summarized in Tables 1 and 2 below, respectively.

Table 1: April 2022 Organic Compound Emissions Test Results

Requirement	Limit	Emissions	
		North Stack	South Stack
Regulation 8-2-301[(a)]	Total Carbon $\leq$ 300 ppmv	8.7 ppmv	6.3 ppmv
Cond. 27348, Part 2[(b)]	> 98% VOC destruction eff.	98.7%	98.9%
Cond. 27410, Part 3	POC $\leq$ 2.74 lbs/hour	1.21 lbs/hour	1.03 lbs/hour
Cond. 27410, Part 3	POC $\leq$ 2.55 tons/year	1.08 tons/year	0.92 tons/year

(a) Stack data is reported as total hydrocarbon (THC). THC may include compounds that are not considered total carbon as defined in Regulation 8-2-202. Total carbon emissions may therefore actually be less than reported here.

(b) From Part 2d, the VOC destruction efficiency requirement is a minimum of 98% by weight, if the inlet concentration is between 200 and 2000 ppmv. The inlet VOC concentration was estimated to be 450-780 ppmv; therefore, the VOC destruction efficiency limit is 98%. Alternatively, the RTOs may demonstrate compliance with Part 2a by emitting less than 20 ppmv of POC. Each RTO also met this alternative outlet concentration limit.

Table 2: October 2022 Organic Compound Emissions Test Results

Requirement	Limit	Emissions	
		North Stack	South Stack
Regulation 8-2-301[(a)]	Total Carbon $\leq$ 300 ppmv	< 2 ppmv	8.9 ppmv
Cond. 27348, Part 2[(b)]	POC $\leq$ 20 ppmv	< 2 ppmv	8.9 ppmv
Cond. 27410, Part 3	POC $\leq$ 2.74 lbs/hour	0.2 lbs/hour	1.45 lbs/hour
Cond. 27410, Part 3	POC $\leq$ 2.55 tons/year	0.25 tons/year	1.79 tons/year

(a) Stack data is reported as total hydrocarbon (THC). THC may include compounds that are not considered total carbon as defined in Regulation 8-2-202. Total carbon emissions may therefore actually be less than reported here.

(b) VOC destruction efficiency was not determined during the October 2022 test. However, the RTOs may demonstrate compliance with Part 2 by emitting less than 20 ppmv of POC.

B. Carbon Monoxide Emissions:

The April 2022 and October 2022 emissions testing also demonstrated compliance with the CO emission rate limit of 84 lbs/MM scf of fuel combusted, as set forth in Condition #27348, Part 10. In all cases, CO emissions were less than half of the permit limit. The CO test results are summarized in Table 3 below:

Table 3: April 2022 and October 2022 Carbon Monoxide Emissions Test Results

Permit Limit	April 2022		October 2022	
	North Stack	South Stack	North Stack	South Stack
84 lbs/MMscf	7 lbs/MMscf	36 lbs/MMscf	4.2 lbs/MMscf	5.5 lbs/MMscf

C. Particulate Matter Emissions:

Schnitzer's initial testing in April and July of 2022 showed that particulate matter emissions exceeded the applicable limits set forth in Condition #27410, Part 3.[4] The April testing showed that the North Stack was emitting PM_{10}[5] at 4.87 lb/hour and 4.34 tons/year, above the permit limits of 3.11 lb/hour and 3.32 tons/year; and that it was emitting Total Suspended Particulate (TSP) at 0.0078 gr/dscf, above the permit limit of 0.0048 gr/dscf. The July testing also showed both the North Stack and South Stack exceeding these limits. For PM_{10}, the North Stack was emitting 6.08 lb/hour and 8.88 tons/year, and the South Stack was emitting 5.74 lb/hour and 8.38 tons/year, both exceeding the permits limits of 3.11 lb/hour and 3.32 tons/year. And for TSP, the North Stack was emitting 0.0143 gr/dscf and the South Stack was emitting 0.0125 gr/dscf, both exceeding the permit limit of 0.0048 gr/dscf.

After receiving these test results, Schnitzer evaluated the two packed bed scrubbers with its equipment vendors and consultants and made repairs to both units. After the repairs were complete, Schnitzer retested the equipment on October 4-5, 2022. This testing showed that, with the repairs, the equipment was operating in compliance with all particulate emission limits. Particulate emissions were found to be about 50% of the permit limits and about 10% of the Regulation 6, Rule 1 emissions limits. The Particulate Matter test results are summarized in Table 4 below:

[4] These initial tests showed emissions in compliance with the particulate matter emission limits in Air District Regulation 6, Rule 1.

[5] PM_{10} refers to fine particulate matter with a diameter of 10 micrometers (μm) or less.

Table 4: October 2022 Particulate Matter Emissions Test Results

Requirement	Limit	Emissions	
		North Stack	South Stack [a]
Cond. 27410, Part 3a	PM10 ≤ 3.11 lbs/hour	1.24 lbs/hour	1.69 lbs/hour
Cond. 27410, Part 3a	PM10 ≤ 3.32 tons/year	1.53 tons/year	2.06 tons/year
Cond. 27410, Part 3b	TSP ≤ 0.0048 gr/dscf	0.0024 gr/dscf	0.003 gr/dscf
Regulation 6-1-310.2 [b]	TSP ≤ 0.0382 gr/dscf (N&S)	0.0024 gr/dscf	0.003 gr/dscf
Regulation 6-1-311.2[c]	TSP ≤ 26.6 lbs/hour	1.24 lbs/hour	1.69 lbs/hour

(a) Although quality assurance issues for the South Stack particulate emissions were noted by the Air District's Source Test Section, the Air District recalculated emissions based on the most conservative assumptions. Testing demonstrated compliance based on the recalculated emissions.

(b) From Table 6-1-310.2, the TSP concentration limit varies based on the exhaust flow rate. The limit is 0.0382 gr/dscf for exhaust gas flow rate ranging from 52,972-70,629 dscfm. For the north stack, exhaust flow rates for normal operation ranged from 60,428-62,349 dscfm. For the south stack, exhaust flow rates ranged from 64,355-65,828 dscfm.

(c) From Table 6-1-311.2, the TSP emission rate limit varies based on the processing rate. For processing rates of 440,925-661,387 pounds/hour, the applicable TSP emission rate limit is 26.6 pounds/hour. The processing rate for both stacks was 292 tons/hour (584,000 pounds/hour) during this source test.

D. Nitrogen Oxide Emissions:

Schnitzer's initial testing showed emissions of NOx well above the permit limit of 50 lb/MMscf of fuel combusted. The April testing showed NOx emissions of 425 lb/MMscf at the North Stack and 560 lb/MMscf at the South Stack, around ten times the permit limit. Schnitzer identified several different mechanical issues that were contributing to the elevated NOx emissions, but even after these mechanical issues were corrected the NOx emissions remained about 20% higher than the permit limit.

Additional source tests and engineering analyses in July and October of 2022 indicated that the excess NOx emissions were being caused by a source of nitrogen in the feedstock being processed in the Metal Shredder. This feedstock-based nitrogen is most likely coming from residual ammonia or similar compounds that are used as blowing agents during the manufacture of foam used as insulation in appliances, cars or objects found in the metal scrap processed by the shredder. During shredding, the heat of the shredding process starts to break down the foam and releases the nitrogen into the shredder enclosure air, which is captured and vented through venturi scrubbers and then to the RTOs. The combustion process at the RTOs converts the feedstock-based nitrogen to NOx. Schnitzer's testing showed that about 70% of the NOx emissions come from feedstock-based nitrogen and about 30% come from the fuel used in the RTO burners. Feedstock-based nitrogen cannot be separated from other enclosure gases and cannot feasibly be controlled. It is also not possible to remove the suspected foam from the metal scrap, much of which is received at the site in compressed blocks.

The Air District was not aware of this additional contributor of NOx emissions when it initially drafted the permit conditions for the RTOs and packed bed scrubbers. The Air District established

the NOx emissions limits in the Authority to Construct based on an assumption that there would be no nitrogen compounds in the exhaust stream coming from the shredder gas, as previous emissions testing at this site had not identified any such compounds. The Air District therefore established the NOx emissions limit based solely on NOx generated as part of the combustion of natural gas fuel in the RTO burners. The NOx emissions limit in the permit is based on an emission rate of 0.05 pounds of NOx created per million BTU of fuel burned in the RTOs, which equates to the 50 pounds of NOx per million scf of natural gas burned in each RTO burner as specified in Part 10 of Condition #27348.

Schnitzer's startup emissions testing showed that NOx emissions from the RTOs alone complied with this 50 lb/MMscf limit specified in the original permit conditions. However, total NOx exceeded that 50 lb/MMscf limit because of the additional, unanticipated feedstock-based NOx contribution from the exhaust gas coming from the Metal Shredder. To address this situation, the Air District is retaining the 50 lb/MMscf limit for NOx emissions from the RTOs alone, to ensure compliance with the requirements for RTO-generated NOx as specified in the Authority to Construct. But it is adding an additional limit applicable to the combination of NOx from feedstock-based nitrogen and NOx from the RTOs directly to ensure that total NOx emissions comply with the Air District's regulatory standards. These NOx limits will apply as follows:

1. The RTOs will be subject to the 50 lbs/MMscf NOx limit per RTO during periods of operation in standby (preheat or idle) mode. Standby mode is defined as any period when the RTO burner is operational, but feed material is not entering the shredder. With no feed entering the shredder, there will be no feedstock-based nitrogen in the shredder exhaust and no additional NOx being contributed to the RTO emissions.
2. When feed is entering the shredder, the RTOs will be subject to an hourly NOx emission limit of 4.23 lbs/hour per stack, which is based on 50 lbs/MMscf of fuel combusted in the RTO plus 0.016 lbs/ton of feed to the shredder during periods of shredder operation.

3. An annual NOx emission limit of 9.03 tons/year will apply for total NOx emissions from the two stacks combined, which is about 2.8 times higher than the original limit.

Requirement to Meet "Reasonably Available Control Technology" Standard

These NOx emissions limits reflect a level of emissions control known as "Reasonably Available Control Technology," or RACT. RACT is defined in Regulation 2-2-225 as the lowest emission limit that is technologically feasible and cost-effective. These NOx emissions must meet a RACT level of emissions control pursuant to Air District Regulations 2-2-301 and 2-2-102. Regulation 2-2-301 requires new and modified sources to implement a level of emissions control called "Best Available Control Technology" (BACT) if the source will have the potential to emit over 10 pounds per day of NOx. But Regulation 2-2-102 provides an exemption from this BACT requirement for "secondary pollutants", which include products of combustion like NOx and CO, that are the direct result of use of abatement equipment – such as the RTOs and Packed Bed

Scrubbers being used here – provided the equipment uses "Reasonably Available Control Technology" (RACT) instead.

The Air District did not conduct an analysis of the RACT level of emissions control for NOx emissions from the RTOs and packed bed scrubbers in the initial Engineering Evaluation because it was believed at the time that NOx emissions would be below the 10 lb/day threshold in Regulation 2-2-301.

However, with the new information about the additional NOx being contributed as a result of the feedstock-based nitrogen, it is now clear that NOx emissions may be as high as 42 lbs/day.[6] This level of emissions puts the RTOs and packed bed scrubbers over the 10 lb/day threshold at which BACT would be required under Regulation 2-2-301- except that the NOx emissions here are "secondary pollutants" (i.e. products of combustion from abatement equipment), so a RACT level of control is required instead of BACT pursuant to Regulation 2-2-102. Demonstrating that total NOx emissions comply with the RACT standard of control required under Regulation 2-2-102 establishes that the emissions are exempt from the BACT requirement in Regulation 2-2-301, and thus that the equipment satisfies the emissions control requirements of Regulation 2, Rule 2.

The Air District therefore conducted an analysis to determine what the RACT level of emissions control requires for this equipment. As noted above, RACT – "Reasonably Available Control Technology" – is defined in Air District Regulation 2-2-225 as the lowest emission limit that is technologically feasible and cost-effective. To apply this standard, the Air District first evaluated whether any additional add-on control equipment would be feasible and cost-effective but found that there were no such options that can be used here. The Air District then determined the lowest emissions level that Schnitzer can feasibly achieve from the RTOs and Packed Bed Scrubbers without add-on control equipment. This analysis is outlined below.

<u>Evaluation of the Potential to Use Add-On NOx Emissions Control Equipment</u>:

There are add-on control devices such as Selective Catalytic Reduction (SCR) or Selective Non-Catalytic Reduction (SNCR) that can reduce NOx emissions. SCR reduces NOx emissions using ammonia in the presence of a catalyst. The major advantages of SCR control technology are the higher control efficiency (70% to 90%) and the lower temperatures at which the reaction can take

[6] Daily NOx emissions are calculated as follows. For burner-based NOx generated from natural gas combustion in the burners, staff assumed 10 hours/day in operation mode and 14 hours/day in standby mode, but staff included also included a 10% margin to account for potential variability in operating or fuel usage rates. Daily emissions were calculated as:
50 lbs/MMscf / 1020 MMBTU/MMscf x 12.75 MMBTU/hr x 10 hrs/day x 1.1 +
50 lbs/MMscf / 1020 MMBTU/MMscf x 4 MMBTU/hr x 14 hrs/day x 1.1 = 6.875 + 3.02 = **9.9 lbs/day** per stack

For feedstock-generated NOx, assuming 10 hours/day of shredder operation, emissions were calculated as:
0.016 lb/ton feed x 400 tons/hour x 10 hrs/day = 64 lb/day, split between 2 stacks = **32 lbs/day** per stack

Combined emissions from burner-based NOx and feedstock-generated NOx are **42 lbs/day** at each stack.

place (400 °F to 800 °F, depending upon the catalyst selected). SCR is widely used for combustion processes where the type of fuel produces a relatively clean combustion gas. However, the temperature of the RTOs' exhaust (200 °F to 300 °F)[7] is too low for operation of SCR systems. In addition, the gases produced by the shredding operation contain compounds that could impair the function of the catalyst. Therefore, SCR is not a feasible control technology for this project.

SNCR utilizes a combustion chamber as the control device reactor, achieving NOx control efficiencies of 30% to 70%. SNCR systems rely on the reaction of ammonia and nitrogen oxide to produce molecular nitrogen and water. However, certain applications are better suited for SNCR than others due to the combustion unit design[8]. SNCRs are not suitable for sources with low NOx concentrations because they are most effective at abating waste streams with NOx concentrations between 200 ppm to 400 ppm. The exhaust stream from the RTOs contains a NOx concentration of less than 10 ppm, well below the optimal range. Additionally, the temperature of the RTOs' exhaust (200 °F to 300 °F) is below the optimal range of operation for SNCR systems downstream of the RTO system. Applications with exhaust streams between 1550 °F to 1950 °F are good candidates for SNCR technology. Therefore, SNCR is not a feasible control technology for this project.

Evaluation of the Most Stringent Achievable NOx Emissions Limit Without Add-On Controls:

With no feasible and cost-effective add-on control equipment available to abate NOx emissions, the Air District next evaluated the lowest emissions rate that Schnitzer can achieve without add-on controls. The NOx emissions are generated both as a byproduct of the oxidation of the gases that the RTOs are abating (feedstock-based NOx emissions) and also as a byproduct of fuel combustion (burner-based NOx emissions). The Air District therefore evaluated both of these NOx sources to see how it can effectively be minimized in a feasible and cost-effective manner.

With respect to feedstock-based NOx emissions, the nitrogen generated from the feedstock processed in the Metal Shredder cannot be separated from the other enclosure gases and cannot feasibly be controlled with any add-on control technology as explained above. It is also not possible to remove the suspected source of feedstock–based nitrogen – foam in appliances, cars and other objects – from the scrap feedstock prior to shredding. As a result, there is no feasible means to reduce NOx generated from the Metal Shredder feedstock.

With respect to burner-based NOx emissions, the RTO vendor has guaranteed a NOx emission rate that will not exceed 50 pounds per million cubic feet of natural gas burned, which equates to 0.05 lb NOx/MM BTU. The Air District compared this emissions performance level to similar RTOs at other facilities. Based on the analysis of emissions testing of permitted RTOs within the Air District, staff is drafting a policy to set a burner-based NOx RACT limit of 0.14 lb/MM BTU for RTOs. The 0.05 lb NOx/MM BTU rate being achieved by Schnitzer's RTOs here is well below this proposed level. Moreover, it is not technologically feasible for Schnitzer's RTOs to achieve a NOx emissions standard below this level without compromising TAC destruction efficiency.

[7] http://www.banksengineering.com/About%20RTOs%20Banks%20Engineering%2010-8-2007.pdf.

[8] EPA Air Pollution Control Technology Fact Sheet, EPA Report EPA-452/F-03-031 https://www3.epa.gov/ttncatc1/dir1/fsncr.pdf.

Lowering NOx emission rates in an RTO is achieved by reducing the operating temperature and possibly the residence time. However, these changes can reduce the efficiency of TAC destruction, which is achieved through thermal oxidation where TACs are exposed to high temperatures and oxygen to convert them to their constituent elements, such as carbon dioxide and water vapor. To ensure a high destruction efficiency of TACs emitted by the shredding process, especially for polychlorinated biphenyls (PCBs) which are difficult to destroy, the Schnitzer RTOs were designed for high temperature operation (1600 °F to 1900 °F). Achieving a lower NOx emission rate than 0.05 lbs/MM BTU would require reducing the operating temperature to a range of 1400 °F to 1500 °F. At this lower operating temperature, the organic toxic compounds may not achieve the necessary destruction efficiency required to keep health risks as low as possible. Additionally, lower residence times can result in incomplete destruction of TACs because there is not enough time for the organic compounds to react with oxygen in the exhaust stream. The Air District has therefore determined that NOx emissions of 0.05 lb/MM BTU from natural gas combustion is the lowest feasible NOx emission rate for this type of application.

For these reasons, the Air District has concluded that the 0.05 lb/MM BTU NOx emissions rate being achieved by the RTOs satisfies the RACT requirement for NOx emissions under Air District regulations and 2-2-102 and 2-2-225. This 0.05 lb/MM BTU NOx limit will be prescribed in Condition #27438, Part 10 for the RTOs during standby mode operation, expressed as 50 pounds of NOx per MM scf of fuel combusted. For operation mode with shredder gas that has nitrogen-containing compounds fed into the RTOs, maximum hourly NOx emissions of 4.23 lb/hour per RTO will be prescribed in Condition #27348, Part 10, to reflect the feedstock-based NOx contribution plus the burner-based NOx during the operation mode, since it is not possible to control or eliminate the feedstock-based NOx contribution. Condition #27348, Part 10, will also incorporate an annual limit of 9.03 tons/year of NOx for both stacks combined.

Schnitzer's startup source testing demonstrated that the equipment is meeting these NOx emissions limits, as shown in Table 5 below. The NOx emission limit during operation has been set with consideration of the potential variability in the source of nitrogen in the feedstock.

Table 5: October 2022 NOx Emissions Test Results

Requirement	NOx Emission Limit	Measured NOx Emissions	
		North Stack	South Stack
Cond. 27348, Part 10, Standby Mode [(a)]	50 lbs/MM scf of fuel (per stack)	22.4 lbs/MMscf	24.3 lbs/MMscf
Cond. 27348, Part 10, Operation Mode [(b)]	4.23 lbs/hour (per stack)	0.92 lbs/hour	0.85 lbs/hour
Cond. 27348, Part 10, Combined Mode	9.03 tons/year (both stacks combined)	2.74 ton/year [(c)]	

(a) The NOx limit for standby mode reflects only burner-based NOx emissions and is the permit limit that was initially included in the Authority to Construct.

(b) The NOx limit for operation mode reflects both burner-based and feedstock-based NOx emissions, and is an additional limit being added in the Permit to Operate.

(c) The 2.74 tons/year emissions from both stacks combined is calculated based on 0.56 tons/year from standby mode emissions and 2.18 tons/year from operation mode emissions.

Recalculation of Cumulative Increase in NOx Emissions and Required Emissions Offsets:

Finally, the additional feedstock-based NOx emissions also require a re-calculation of the facility's cumulative increase in NOx emissions and requires additional NOx offsets to be provided for the facility's un-offset cumulative increase under Air District Regulation 2-2-302. As explained in the Engineering Evaluation (see p. 8), the facility's cumulative increase in NOx emissions prior to the implementation of this project was 11.913 tons/year, all of which has previously been offset. The Air District initially calculated a further increase of 3.267 tons/year of NOx, for which offsets – banked Emission Reduction Credits from the Air District's emissions bank – would have to be provided. Based on the new information about feedstock-generated NOx emissions, it is now clear that the further increase in NOx emissions is 9.027 tons/year of NOx, as outlined above. This means that the new cumulative increase for the facility will be 20.940 tons/year of NOx (11.913 tons/year + 9.027 tons/year), and that 9.027 tons/year of NOx offsets must be provided. The Air District is updating its record of the facility's cumulative increase to reflect the correct 20.940 tons/year cumulative increase for NOx. The Air District is also providing additional offsets from its Small Facility Banking Account in connection with the issuance of the Permit to Operate to ensure that the cumulative increase is fully offset as required by Regulation 2-1-302.1.[9]

E. Toxic Air Contaminant Emissions

As explained in the Engineering Evaluation, the Air District conducted a Health Risk Assessment (HRA) to evaluate the potential health impacts from Toxic Air Contaminants (TACs) that would be emitted from the new pollution control equipment Schnitzer has installed. The HRA was based on assumptions of TAC emission rates based on prior testing of shredder TAC emissions, thermal oxidizer destruction efficiency estimates, venturi scrubber particulate removal efficiency estimates, the capture efficiency for the shredder enclosure (assumed 95%), and calculations of toxics generated by combustion based on shredder gas compositions and emissions factors published by the US Environmental Protection Agency for toxic emissions generated by combustion of natural gas fuel. (*See* Engineering Evaluation at pp. 8-10 and Appendix A.) The HRA estimated that, after installation of these abatement systems, the residual cancer risk from the metal shredder, its abatement systems, and several sources permitted earlier under related permit applications would be 2.8 chances in a million, which was below the Regulation 2-5-302 project risk limit of 10.0 chances in a million. The HRA further found that for non-cancer health risk, TAC exposures at the location of the maximally exposed individual were below the levels at which no observable health impacts would be expected. Given these low levels of toxic risk, which were well within the limits set forth in Air District regulations, the Air District concluded that the TAC emissions complied with the applicable regulatory requirements for obtaining a permit.

[9] Since the facility's total potential to emit for NOx is less than 35 tons per year and the facility does not own any NOx emission reduction credits, Schnitzer may avail itself of credits from the Small Facility Banking Account. In this case, the amount of offsets required is calculated at a 1:1 ratio as provided for in Regulation 2-2-302.1.

In issuing the Authority to Construct for the project, the Air District imposed permit conditions requiring Schnitzer to evaluate the equipment's TAC emissions after it was installed. This is important to confirm that actual TAC emissions conform to the estimates the Air District used in its analysis. The permit conditions require that, if measured TAC emissions exceed the levels the Air District used in the HRA, then Schnitzer must undergo a further HRA using actual TAC emissions levels to confirm that the project complies with applicable regulatory requirements at its actual, measured emission rates. Parts 11 and 13 of Condition #27348 require testing after initial installation and once every five years to confirm that TAC emission rates conform with emissions evaluated in the HRA. Emission rates for TACs that have the most influence on health risks are identified in Part 11d.

Part 11b identified the cancer risk for the maximally impacted receptor that was determined by this earlier HRA. The table below compares the emission rates measured during the April 2022 source test to the emission rates listed in Part 11d. TAC emission rates of arsenic, 1,3-butadiene, and PCBs exceeded the action level thresholds in Part 11d.

Table 6: Summary of TAC Emission Limits and April 2022 Test Results

TAC	Action Level Thresholds in Part 11d at AC Issuance (lb/hour)	Total Stacks (lb/hour)	North Stack (lb/hour)	South Stack (lb/hour)
Arsenic [(a)]	0.0000082	0.000045	0.000012	0.000033
Benzene	0.024	0.014	0.0087	0.0056
Butadiene, 1,3- [(a)]	0.00061	0.00091	0.00049	0.00042
Cadmium [(a)]	0.0005	0.000018	0.0000067	0.000012
Chromium, Hexavalent	0.000078	0.000034	0.0000063	0.000028
Ethyl Benzene	0.05	0.025	0.012	0.013
Lead	0.0032	0.00031	0.000092	0.00022
Nickel	0.0015	0.00034	0.00015	0.00019
PCBs	0.00034	0.00063	0.00021	0.00042
Toluene	0.2	0.13	0.071	0.062

(a) The average measured emission rates for the compound included at least one fraction below the detection limit for the test. The reported emission rates used one-half the detection limit to calculate the average emissions shown here.

A revised HRA is required since emissions of three TACs exceeded the action level thresholds in Condition #27348 Part 11d.

Revised Health Risk Assessments:

For this HRA revision, the Air District conducted HRAs for both a pre-project scenario and a post-project scenario to provide additional information for this Permit to Operate decision. These HRAs, the results, and applicable project risk requirements are summarized below and discussed in detail in the attached March 4, 2024 HRA report.

The pre-project scenario includes the equipment configuration for the metal shredder operations that existed prior to this abatement project: the metal shredder surrounded by an enclosure equipped with two high-capacity blowers that each vent to a venturi scrubber and then to a single stack (P-15). Metal Shredder emissions include the fugitive emissions from the shredder enclosure and the stack emissions from P-15. TAC emissions for this pre-project scenario were determined using updated emission factor estimates for shredder fugitive emissions and pre-control stack emissions. These updated emission factors included an expanded list of potential TAC emissions that was derived from all available source test data (conducted both prior to and after the installation of the abatement equipment). Annual emissions were calculated using the 3-year average baseline throughput rate for the shredder (691,314 tons per year). This pre-project scenario also includes the sources (S-11, S-13, and S-16) and associated maximum permitted emission rates from related applications that were included in the initial HRA for this application.

The post-project scenario includes the installed equipment configuration: the metal shredder surrounded by an enclosure equipped with two high-capacity blowers that each vent to a venturi scrubber followed by a thermal oxidizer, acid gas scrubber, and stack. Metal Shredder emissions include the fugitive emissions from the shredder enclosure and the stack emissions from the two new stacks (P-17 and P-18). Fugitive emissions from the shredder enclosure were based on an assumed 95% capture efficiency, which was confirmed by a capture efficiency study (see section below on capture efficiency). TAC emissions for this post-project scenario were determined using updated emission factor estimates for shredder fugitive emissions, which are the same as the fugitive emission factors for the pre-project scenario. Improved estimates of abated emission factors were determined based on post-control source tests. These post-control tests are the origin of the expanded list of potential TAC emissions for the shredder, which includes TACs that were detected during source testing as well as those that were tested for but not detected. Annual emissions were calculated using these improved TAC emission factors and the maximum permitted annual throughput rate to the shredder (720,000 tons per year). This post-project scenario also includes the sources (S-11, S-13, and S-16) and associated maximum permitted emission rates from related applications that were included in the initial HRA for this application.

All TAC emission rates for each scenario are identified in Appendix A to the March 4, 2024 HRA. For the post-project scenario, the proposed hourly and annual emission rate estimates for the most significant TACs are presented in Table 7.

Table 7 – Significant Toxic Air Contaminant Emissions from Metal Shredder

TAC	Fugitive Emissions		Total Stack Emissions	
	lb/hour	lb/year	lb/hour	lb/year
Acrylonitrile	0.0033	2.88	0.0042	7.56
Arsenic	0.000056	0.043	0.00011	0.19
Benzene	0.1100	144	0.0280	50.40
Butadiene, 1,3-	0.0017	2.88	0.0011	2.02
Cadmium [(a)]	0.00024	0.43	0.00044	0.79
Chromium, Hexavalent [(a)]	0.00008	0.14	0.00010	0.18
Dioxins/Furans	0.0000	0.00	0.000000020	0.000036
Ethyl Benzene	0.2400	288.	0.0440	79.20
Lead [(a)]	0.0020	3.60	0.0032	5.76
Manganese	0.0006	0.80	0.0011	2.05
Mercury	0.0018	3.16	0.0034	6.12
Naphthalene [(a)]	0.0080	14.4	0.0030	5.40
Nickel	0.00025	0.36	0.00048	0.86
PAHs, as benzo(a)pyrene	0.0000	0.00	0.0016	2.84
PCBs	0.0014	1.44	0.0011	1.94
Toluene	0.9400	826.	0.2400	432.
Xylenes	1.2400	1090.	0.2400	432.

(a) After the March 2024 HRA was completed, the Air District revised the estimates of maximum hourly fugitive emission rates for cadmium, hexavalent chromium, lead, and naphthalene to ensure consistency with annual emission estimates. However, the changes in these hourly emission rate estimates have no impact on the HRA results, because these four compounds do not have acute health effects values and do not contribute to acute health impacts.

Health Risk Summary:

Health risks for the pre-project and post-project scenarios are presented in Table 8 below. This abatement project results in reductions for each type of health risk. This abatement project reduces cancer risk by 74%, reduces chronic hazard index by 36%, and reduces acute hazard index by 65%.

Although the post-project cancer risk estimate (5.7 in a million) is not as low as the initial cancer risk estimate (2.8 in a million) for this application, the current post-project cancer risk complies with the applicable project cancer risk limit for Application #30009.[10] For non-cancer risks, the chronic hazard index and acute hazard index are less than project risk limits of 1.0, which indicates

[10] When the Authority to Construct for Application #30009 was approved in 2021, the applicable project cancer risk limit was 10.0 in a million pursuant to in Regulation 2-5-302.1. Effective July 1, 2022, the Air District added a more stringent cancer risk limit to Regulation 2-5-302.1 for projects located in Overburdened Communities. This project is limited to the more stringent project cancer risk limit of 6.0 in a million, because the Schnitzer Steel facility in Oakland, CA is located in an Overburdened Community as defined in Regulation 2-1-243.

that TAC exposures at the location of the maximally exposed individuals are below the levels at which observable health impacts would be expected.

Table 8. Summary of Health Risk Estimates for Application #30009

	Cancer Risk (in a million)	**Chronic Hazard Index**	**Acute Hazard Index**
Pre-Project Actual Emissions	21.6	0.127	0.42
Post-Project Maximum Emissions	**5.7**	**0.082**	**0.15**
Project Risk Reductions	15.9	0.045	0.27
Risk Reduction Percentage	74%	36%	65%
Project Risk Limits for Post-Project Scenario	**6.0**	**1.0**	**1.0**

Table 9 presents the maximum source risks for the post-project metal shredder and abatement systems. This metal shredder abatement project results in a physical change of the source and was expected to result in several toxic air contaminants that were not previously emitted, including the following combustion product TACs: polychlorinated dibenzo-p-dioxins (dioxins), polycyclic aromatic hydrocarbons (PAHs), hydrogen chloride, and hydrogen fluoride. These TACs are generated in the RTOs by combustion of natural gas and captured gases from the shredder enclosure. Since the residual cancer risk exceeded 1.0 in a million, this project was deemed to be a modification for the purposes of toxic new source review[11] and the metal shredder triggers Best Available Control Technology for Toxics (TBACT) for cancer risk pursuant to Regulation 2-5-301. Non-cancer impacts do not trigger TBACT, because the maximum chronic hazard index for the Metal Shredder and Abatement Systems is less than 0.20.

Table 9. Post-Project Maximum Source Risks for Shredder Operations

	Cancer Risk (in a million)	Chronic Hazard Index	Acute Hazard Index
Impacts from Shredder Enclosure: Residual Fugitive Emissions	3.9	0.067	0.12
Impacts from Stacks (P-17 & P-18): Post-Project Abated Emissions	1.7	0.012	0.022
Total Source Risks for Metal Shredder and Abatement Systems	5.6	0.079	0.15
TBACT Source Risk Thresholds (Regulation 2-5-301)	1.0	0.20	NA

[11] Regulation 2-5-214 defines a modified source of toxic air contaminants as: "An existing source that undergoes a physical change, change in the method of operation, or increase in throughput or production that results or may result in any of the following:" [214.4] "The emission of any toxic air contaminant not previously emitted in a quantity that would result in a cancer risk greater than 1 in a million (10^{-6}) or a chronic hazard index greater than 0.20."

This revised post-project HRA estimates health risks for fifty-five toxic air contaminants based on updated toxic emission factor estimates. The list of TACs and the updated emission factors are derived from post-project source test data. TBACT was triggered for the metal shredder because the total cancer risk from the post-project metal shredder exceeds the TBACT cancer risk threshold of 1.0 in a million.

As shown in Table 9, the estimated cancer risk for the post-project metal shredder operations is 5.6 in a million. The pollutants that contribute most to this cancer risk are: hexavalent chromium, Cr(VI) (42%), polychlorinated biphenyls, PCBs (24%), polycyclic aromatic hydrocarbons, PAHs (8%), benzene (7%), and dioxins (7%). Cr(VI), PCBs, and other metals are produced during the shredding process. PAHs and dioxins are generated during RTO combustion of natural gas and captured gas from the shredder enclosure. Benzene may be generated during the shredding process and as a product of natural gas combustion.

To ensure that emissions and impacts stay within the applicable health risk limits, the Air District is proposing to impose hourly TAC emission limits at the shredder stacks.

Compliance with Best Available Control Technology for Toxic Air Emissions:

As noted above, Schnitzer is required to use TBACT – the Best Available Control Technology for controlling TAC emissions – to limit TAC emissions as much as possible. The Air District evaluated TBACT for Schnitzer's metal shredding operation in the initial Engineering Evaluation and determined that TBACT requires full enclosure of the shredding operations in a building with minimal openings and a high-capacity building ventilation system capable of capturing at least 95% of all emissions, coupled with a venturi scrubber system capable of removing at least 90% of all particulate TAC emissions and a thermal oxidizer/packed bed scrubber abatement system capable of achieving destruction of at least 98% of acid gases.
Given the importance of the shredder enclosure's capture efficiency in controlling TAC emissions, limiting public health risk, and ensuring compliance with the TBACT requirement, the Air District and Schnitzer Steel agreed to conduct a study of the capture efficiency to assess whether enclosure is meeting the 95% capture and associated shredder emissions calculations.

Schnitzer contracted with two source testing firms, Lagus Applied Technology, Inc. and Montrose Air Quality, to develop a capture efficiency testing plan for Schnitzer's metal shredder enclosure. There is no promulgated reference test method specific to this application, necessitating the development of a unique testing protocol based on standard methods and engineering principles. The testing firms used ASTM E2029 "Standard Test Method for Volumetric and Mass Flow Rate Measurement in a Duct Using Tracer Gas Dilution" with testing conducted under specialized operating conditions that were necessary to avoid damage to testing equipment and to avoid loss of tracer gas through the downstream abatement equipment. The operating conditions included: fans at normal flow rates, enclosure openings in standard positions, closed ambient air dampers, shredder, conveyors, and water sprays not operating, and downstream abatement devices not

operating. In addition to measuring capture efficiency using tracer gas, the testing plan also included measurement and calculation of parameters that were intended to demonstrate that the total enclosure criteria described in EPA Method 204 "Criteria for and Verification of a Permanent or Temporary Total Enclosure" are also met. In accordance with EPA Method 204, an enclosure that meets all of the Method 204 criteria and that ducts all gases from the enclosure to a control device may be assumed to have a volatile organic compound capture efficiency of 100%, and capture efficiency need not be measured. The Air District reviewed and commented on the test plan in advance of the testing. The testing firms conducted the capture efficiency testing on January 27-28, 2024. The Air District determined that testing was done by qualified personnel following reasonable QA procedures.

The Air District received initial reports for the January 2024 capture efficiency test and engineering study on March 18, 2024, and amended reports on June 7, 2024.[12] These reports identified a capture efficiency of greater than 98% for the shredder enclosure. While the Air District acknowledges the greater than 98% capture efficiency reported, given the inherent uncertainties in conducting this unique capture efficiency test, the Air District has concluded that an inferred enclosure capture efficiency of 95% by weight is an appropriately conservative and reasonable engineering approach. The basis for this conclusion is that the EPA Method 204 total enclosure criteria were met including:
(a) calculated ratio of natural draft openings compared to total enclosure wall area is less than 5%,
(b) calculated average face velocity is greater than 200 feet per minute,
(c) demonstrated air flow into the enclosure, and
(d) average measured pressure drop is greater than 0.007 inches of water

In Condition # 27410, Part 2, the Air District is improving operating requirements for the enclosure by requiring that Schnitzer follow an operating and maintenance plan for the shredder enclosure, which includes closure of specific openings, inspection and maintenance of the enclosure and curtains, and record keeping for all monitoring, inspection, and repair events.

The Air District is also adding pressure drop monitoring during shredder operation to Condition #27410, Part 2e to assure on-going compliance with the Air District's inferred minimum enclosure capture efficiency of 95%.

The Air District has been requiring monitoring of amperage of each enclosure fan to ensure that enclosure air flow is sufficient. When Schnitzer installed its new air pollution control equipment, it also replaced its existing shredder enclosure fans with new fans for efficiency reasons. The new fan motors operate at a higher voltage and lower amperage than the previous fan motors. The Air District is therefore adjusting the amperage requirement for the shredder enclosure ventilation fans in Condition #27410, Part 2d. This change will not have any effect on emission limits or on Schnitzer's compliance with applicable regulatory requirements and is discussed in more detail later in this report.

[12] Outside Test CST-10243; January 24-28, 2024, at Facility A0208, Schnitzer Steel Products Company

IV. PERMIT TO OPERATE ISSUANCE

As Schnitzer has established that its new pollution abatement equipment is operating in compliance with applicable permit limits and related regulatory requirements, the Air District is proposing to issue Schnitzer a Permit to Operate for this equipment in accordance with District Regulation 2-1-411.

In doing so, the Air District is revising several permit conditions from the conditions specified in the Authority to Construct (in addition to adding the additional NOx emissions limit and revising TAC emission rates, as discussed above). These permit condition revisions, aside from formatting changes and correcting errors, are discussed below.

A. Minimum Combustion Zone Temperature

The Air District evaluated the combustion zone temperatures of the RTOs in the April 2022 source test and determined that the minimum temperature required by the permit conditions should be increased to ensure proper destruction efficiency of TACs. The source test temperatures averaged 1848 $^{\circ}$F. As a result, the minimum combustion zone temperature was increased, in Part 3 of Condition #27348, from 1600 $^{\circ}$F to 1830 $^{\circ}$F. The proposed limit of 1830 $^{\circ}$F is equal to 90% of the measured temperature and will provide a small compliance buffer. As previously discussed, higher combustion zone temperatures lead to greater destruction efficiencies of TACs. The temperature shall be averaged over a 15-minute period because momentary deviations from this temperature requirement are not expected to have any significant impact on the average destruction efficiency achieved by the RTOs. Additionally, the Air District is adding provision to allow the Air District to adjust the operating temperature limit if source test data demonstrates compliance at a different temperature.

Due to this change in Part 3, the thermocouple operating range in Part 4 of Condition #27348 was also modified. The thermocouple is a temperature measuring device used to continuously measure the temperature in each RTO. The maximum operating temperature was increased from 1700 $^{\circ}$F to 1900 $^{\circ}$F.

B. Packed Bed Scrubber Parametric Monitoring

The Air District is adding an averaging period for parametric monitoring limits because momentary deviations in these parameters are not expected to impact the performance of the scrubbers, which is typically measured over at least a 1.5-hour period (three ½ hour test runs) during source testing. The exhaust gas flow rate and liquid flow rate to each Packed Bed Scrubber in Condition #27348 Part 9 shall be averaged over a one-hour period. In addition, the Air District is adding provisions to allow the Air District to adjust these parametric limits if source testing demonstrates compliance with the relevant emission limits at alternate parametric limits.

Furthermore, the Air District is adding an effective pressure differential operating range for each packed bed scrubber to Condition #27348 Part 9 as an indicator of scrubber efficiency during shredding operations.

C. Health Risk Assessment Requirements and Limits

If future source testing demonstrates that a TAC emissions rate in Part 11d is exceeded, the permit conditions require a revised HRA based on actual testing rates to ensure that project risk limits are met. In Part 11b, the unattainable cancer risk limit of 3 in a million is removed. Part 11b already references the applicable project risk limits in Regulation 2-5-302. For this application, the applicable project risk limit for the metal shredder is a cancer risk of 6.0 in a million.

D. Monitoring and Recordkeeping Requirements

The Air District evaluated the feasibility of installing a Continuous Emissions Monitoring System (CEMS) at the RTO stacks to better understand NOx emissions from feedstock variability. The Air District's Source Test Section evaluated several of the RTO parameters and determined that CEMS would not be feasible at this site for the following reasons:

- CEMS is ideal for steady-state continuous operation of sources like boilers or turbine generators. Schnitzer's shredder and RTOs do not operate continuously.
- The low NOx concentration in the exhaust stream (<1 ppm) lowers the accuracy of the results.
- The high moisture concentration in the exhaust can lead to clogging of the pitot tubes used to measure flow speed.

Instead, the Source Test Section recommends increased source testing for more accurate readings of NOx. Therefore, the frequency of emissions testing is increased from yearly to quarterly to determine compliance with the limits set forth in Condition #27348 Parts 10c and 10d. The quarterly testing will determine NOx emissions while the shredder is in operation as required by Part 12 of the permit condition. NOx testing frequency during shredder operation may be reduced to an annual basis if continued compliance is demonstrated for at least two years and emissions are no more than 80% of the limit.

E. Shredder Enclosure Fan Motor Amperage

The Air District is revising the provision in Condition #27410, Part 2, specifying a minimum operating current of 480 amps for the shredder enclosure fan motors during shredder operations. Schnitzer replaced the existing shredder enclosure fans for efficiency reasons when it installed the RTOs. The new fan motors operate at a higher voltage and a lower amperage than the previous fan motors. The average amperage determined during the October 2022 emissions test report was 97 amperes and the average amperage determined during the January 2024 capture efficiency test was 91 amperes for the two fans. To provide a small compliance buffer the Air District is setting the limit at 90% of the average amperes measured during the capture efficiency test (91 amperes * 0.9 = 82 amperes) averaged over an hourly period. As a result, the permit requirement is modified from 480 amperes to 82 amperes. This change will not affect any emission limits. In addition,

language is added to allow the Air District to adjust this operating parameter if source test results demonstrate compliance with applicable limits at alternative minimum fan amperes.

F. Water Flow Rate to Venturi Scrubbers

Schnitzer requested to reduce the minimum water flow rate, currently 300 gallons per minute (gpm), to each venturi scrubber to 200 gpm. The Air District will change the water flow rate to 260 gpm, which is 90% of the lowest water flow rate measured during the October 2022 source test (289 gpm * 0.9 = 260 gpm). Condition #27410, Part 2 will be changed accordingly and a 1-hour averaging period will be added because momentary changes in scrubber water flow rate will not impact the average hourly particulate control rate achieved by the venturi scrubbers. In addition, language is added to allow the Air District to adjust this operating parameter in the future if source test results demonstrate compliance with PM emission limits at alternative minimum water flow rates.

G. Venturi Scrubber Pressure Differential Operating Range

Schnitzer requested that the effective pressure differential operating range for each venturi scrubber be modified from 15-22 inches of H_2O to 10-22 inches of H_2O. However, the April and October 2022 source test reports do not support this request. There were four runs when the venturi scrubber pressure drop decreased to below 15 inches of H_2O. For two of those runs the particulate matter readings exceeded the 0.0048 gr/dscf limit. Since compliance was not demonstrated at the lower pressure differential operating range, the Air District will not approve this change to Condition #27410, Part 2.

H. Enclosure Pressure Drop

To provide on-going assurance that the shredder enclosure is achieving a minimum of 95% capture efficiency during shredding operations, the Air District is adding a requirement to monitor the pressure drop at a minimum of four locations, which will be approved by the Air District, once during each operating day and that the average pressure drop be at least 0.007 inches of water with a demonstrate of air flow inward into the enclosure at each location.

V. CALIFORNIA ENVIRONMENTAL QUALITY ACT CONSIDERATIONS

As explained in the Engineering Evaluation, the Air District reviewed and considered the documentation prepared by the Port of Oakland for the installation of the new air pollution control equipment pursuant to the California Environmental Quality Act (CEQA), including the Port's "Second Addendum to Schnitzer's Stormwater Improvement Project Initial Study/Negative Declaration" dated September 3, 2020 (Addendum). This CEQA analysis concluded that the installation and operation of the new air pollution control equipment would have a significant *beneficial* environmental impact and would not result in any significant adverse environmental impacts associated. (*See* Engineering Evaluation, at p. 19.)

Given the change in the Air District's understanding of the project because of the new information about shredder feedstock-based NOx emissions and evaluation of site-specific TAC emissions, the Air District has considered whether there is a need for any new CEQA environmental analysis under CEQA Section 21166 (Cal. Pub. Res. Code § 21166) and Section 15162 of the state CEQA Guidelines (14 Cal. Code Regulations § 15162). Those provisions establish that a public agency should continue to rely on the previous CEQA environmental analysis – and prohibit undertaking any new CEQA analysis – unless changes in the project and/or new information suggest that there may be new significant adverse environmental effects from the project or a substantial increase in the severity of previously identified significant effects.

The Air District has considered whether any additional CEQA environmental review would be required under these provisions. Specifically, the Air District evaluated whether there would be any new significant environmental impact as a result of the additional feedstock-based NOx emissions that were not anticipated at the time of the original CEQA environmental analysis or from residual health impacts based on measured TAC emission levels. The Air District has developed Thresholds of Significance for use in this analysis.[13] The Air District's Threshold of Significance for NOx establishes that the impacts from NOx emissions become significant if the emissions exceed 10 tons/year. Here, NOx emissions will not exceed 9.027 tons/year from both RTOs combined, as specified in revised Part 10.d. of Condition #27348 – including both the 3.267 tons/year of thermal NOx from combustion in the RTOs anticipated in the Engineering Evaluation and the additional 5.76 tons/year of feedstock-based NOx. The Air District's Thresholds of Significance for project level risks and hazards establishes that impacts become significant if the project cancer risk is greater than 10.0 chances in a million or if an increased non-cancer hazard index is greater than 1.0 for both chronic and acute. Overall, the installation of the RTOs and packed-bed scrubbers to control emissions from shredder operations results in a beneficial reduction in risks and hazards at this facility. Furthermore, the Air District is also comparing total post-project residual health risks from shredder operations to the risks and hazards Thresholds of Significance. As previously stated, the maximum cancer risk for this project, after installation of the abatement equipment, is 5.7 chances in a million and the maximum chronic hazard index and acute hazard index are 0.082 and 0.15, respectively. These residual health risks from the shredder operations are also below the Thresholds of Significance for risks and hazards. Accordingly, there will be no new significant impacts, or any substantial increase in the severity of any previously identified significant impacts, as a result of the new information and changes associated with the feedstock-based NOx emissions and residual TAC emissions. As a result, there is no subsequent or supplemental environmental analysis required under CEQA Section 21166 and Guidelines Section 15162.

The Air District is therefore proposing to issue the Permit to Operate on the same basis it issued the Authority to Construct, as described in the Engineering Evaluation. The Air District has reviewed and considered the project's environmental impacts as discussed in the Addendum and earlier Negative Declaration analyses pursuant to CEQA Guidelines Section 15096 and has

[13] *See* 2022 BAAQMD CEQA Air Quality Guidelines (April 2023), at p. 3-4 Table 3-1, available at: https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines.

determined that there will be no significant environmental impacts. As the project will not have any significant impacts, there is no need to consider alternatives or mitigation measures (beyond what the Air District is imposing anyway under its own regulations) to avoid or minimize any such impacts. The Air District will publish a Notice of Determination in connection with the issuance of the Permit to Operate in accordance with CEQA Guidelines Section 15096(i), 14 Cal. Code Regulations § 15096(i).

VI. CIVIL RIGHTS AND ENVIRONMENTAL JUSTICE CONSIDERATIONS

The Air District's permitting decisions must comply with federal and state civil rights laws, including Title VI of the Civil Rights Act of 1964[14] and California Government Code section 11135, and regulations promulgated under those laws. The Air District also endeavors to ensure that its permitting decision-making is informed by and consistent with environmental justice principles.

The Air District has not historically provided written civil rights or environmental justice analyses in connection with the permitting process, but it has recently committed to an increased focus on civil rights and environmental justice, and community advocates have specifically requested that the Air District address these issues in its review of this permit application and of two additional pending permit applications (Application Numbers 29573 and 30009) related to the Schnitzer Steel Oakland facility. The Air District is therefore providing this analysis to allow for public review and comment.

Civil rights and environmental justice concerns are especially important for permits issued in West Oakland, where Schnitzer's facility is located, for several reasons. For one, West Oakland has a far higher proportion of Black residents than the Bay Area as a whole. Further, it is well-documented that West Oakland residents have been, and continue to be, exposed to comparatively high cumulative levels of pollution that amplify the impact of new and ongoing pollution sources.[15]

This proposed permitting decision would comply with Title VI and Government Code section 11135 and regulations promulgated under those laws and would accord with broader principles of environmental justice. The abatement equipment that is the subject of this application is significantly benefitting any potentially impacted residents by reducing emissions from Schnitzer's facility. To the extent that the abatement equipment may have adverse impacts, those

[14] 42 U.S.C. § 2000d et seq.; *see also* 40 C.F.R. Part 7.

[15] *See, e.g.*, Lily MacIver, Univ. of Cal., Berkeley, *AB617 in West Oakland: Community-Based Air Pollution Abatement Planning* 17-22 (2019), https://www.baaqmd.gov/~/media/files/ab617-community-health/west-oakland/final_ab-617-in-west-oakland-pdf.pdf?la=en&rev=b47178d004774010a3830679f9e7f556; Darryl Fears & John Muyskens, *City Planners Targeted a Black Community for Heavy Pollution. Can the Damage Be Undone?*, Wash. Post (May 7, 2023), https://www.washingtonpost.com/climate-environment/2023/05/07/oakland-freeways-environmental-justice/.

adverse impacts are far outweighed by the positive impacts and would be subject to mitigation requirements.[16]

The proposed permitting decision would grant Schnitzer a permit to operate its two RTOs and two packed bed scrubbers to abate emissions of POCs and TACs from its shredder. This abatement equipment has decreased the shredder's potential to emit POCs from approximately 236.7 tons per year to 3.9 tons per year and has substantially reduced all health impacts for Schnitzer's facility. As described above, however, installation of the RTOs and packed bed scrubbers does involve combustion product emissions, including NOx and CO. These combustion product emissions result from the combustion of natural gas to provide heat to the RTOs, as well as from the combustion of POCs and other pollutants in the exhaust stream from the shredder.

In a case with mixed harms and benefits, legal precedent suggests an agency decision does not give rise to an unlawful disparate impact under Title VI regulations (and, by extension, under Government Code section 11135[17]) if two factors are met. First, benefits to the affected group must offset or outweigh the harms to that group.[18] Second, adverse impacts to the protected group should be mitigated, if possible.[19]

Here, these two factors are met. First, the benefits to neighboring residents and workers from the reductions in POCs and TACs far outweigh the potential harm from the combustion product emissions. Although NOx emissions have been greater than first anticipated when the authority to construct was issued, the massive decreases in POC emissions and, to a lesser but still significant extent, TAC emissions comfortably outweigh the comparatively minor increases in combustion product emissions. On a mass basis for ozone precursors (POC and NOx), the POC emission reductions are about 25 times higher than the NOx emission increases. If project emission increases

[16] Because the abatement equipment will be overwhelmingly beneficial on balance and because emissions from the abatement equipment must be mitigated, this analysis need not resolve the question of whether any of the combustion product emissions, viewed independently, constitute adverse impacts pursuant to Title VI and Government Code section 11135. However, EPA guidance provides that relevant environmental statutes, regulations, or policies may be used to help answer this question. *See* U.S. EPA's External Civil Rights Compliance Office Compliance Toolkit (Jan. 18, 2017), 12-13 & n.52, https://www.epa.gov/sites/default/files/2017-01/documents/toolkit-chapter1-transmittal_letter-faqs.pdf; 78 Fed. Reg. 24,739, 24,741-42 (2013); 65 Fed. Reg. 39,650, 39,661 (2000). The Air District has adopted CEQA Thresholds of Significance that it uses to assess whether emissions may have a significant impact in the CEQA context, which could be applied in the civil rights context under EPA's guidance. To the extent that the Air District's CEQA Thresholds of Significance may provide an appropriate measure of whether impacts are sufficiently adverse for civil rights purposes, the combustion product emissions do not exceed any relevant CEQA Thresholds of Significance.

[17] *Darensburg v. Metro. Transp. Comm'n*, 636 F.3d 511, 519 (9th Cir. 2011) ("In light of the parallel language of [Government Code section 11135 and Title VI], federal law provides important guidance in analyzing state disparate impact claims.").

[18] DOJ, Title VI Legal Manual, Section VII- Proving Discrimination- Disparate Impact (discussing *Nat'l Ass'n For Advancement of Colored People v. Med. Ctr., Inc.*, 657 F.2d 1322, 1340 (3d Cir. 1981) and *United States v. Bexar Cty.*, 484 F. Supp. 855, 859 (W.D. Tex. 1980)).

[19] *Id.*

and reductions are compared to Alameda County emissions,[20] the project increases are 0.053% of Alameda County NOx emissions and 0.0082% of Alameda County CO emissions and project emission reductions are 1.21% of Alameda County POC emissions. A comparison of these percentages demonstrates that the POC emission reductions are of much greater importance on a sub-regional scale than the incidental increases in NOx and CO emissions. In addition, as discussed above in Section V. CEQA Considerations, the proposed NOx emission rates are less than the Air District's CEQA Threshold of Significance for project NOx emissions, which indicates that these project NOx emissions will not result in any significant adverse environmental impacts. When considering health impacts, the project results in a 74% reduction in cancer risk, 36% reduction in chronic non-cancer impacts, and a 65% reduction in acute non-cancer impacts. These local health impact reductions are expected to be greater than any potential local non-cancer impacts from incidental NOx and CO increases.

Second, the combustion products associated with the abatement equipment are necessary to achieve these benefits and are subject to mitigation. There is no alternative abatement mechanism or, as described above and in the initial Engineering Report, add-on abatement device of which the Air District is aware that would further reduce emissions. The Air District has imposed limits on the abatement equipment's emissions and has found that the equipment complies with BACT and RACT, as applicable to these incidental combustion product emissions.

Because this proposed permit decision would, on balance, be beneficial to the surrounding community and because it requires mitigation for combustion product emissions, among other reasons, it would be consistent with the civil rights laws and regulations and with environmental justice principles.

EPA has also highlighted the importance of public involvement for civil rights compliance and for consistency with environmental justice principles. Here, the Air District has taken a number of steps to ensure adequate public involvement.

For example, the proposed permit conditions and accompanying Engineering Evaluation are being released for public comment pursuant to Regulation 2, Rule 1, section 412.1, which requires a public comment period before an authority to construct or permit to operate is issued for a source located in an overburdened community that requires a health risk assessment under District toxics regulations. Regulation 2, Rule 1, section 412.1 requires a public comment opportunity in a broader range of instances than is required by the federal Clean Air Act, and this particular permit application does not require a public comment period under federal law.

Further, the Air District has made materials available that will assist the public in meaningfully commenting on the permitting decision. In addition to the draft permit to operate, the Air District has prepared this Engineering Evaluation and other explanatory documents oriented toward the general public and has released the HRA for public review. The public notice and an explanatory

[20] Bay Area Emissions Inventory – Summary Report for Criteria Air Pollutants, February 2024, Table 1, https://www.baaqmd.gov/~/media/files/planning-and-research/emission-inventory/bay-area-emissions-inventory-summary-report.pdf?rev=aab699bc8277450598292f0537b2c2a7&sc_lang=en.

fact sheet for this proposed decision have been translated into the four most used languages in the Bay Area other than English: Spanish, Chinese, Tagalog, and Vietnamese.

VII. PERMIT CONDITIONS

Regenerative Thermal Oxidizers (A-15 and A-16) and Packed Bed Scrubbers (A-17 and A-18) are currently subject to Condition # 27348 and 27410. Proposed changes to Condition # 27348 and 27410 are shown in strikeout and underline format.

Condition # 27348

A-11 Venturi Scrubber, A-12 Venturi Scrubber, A-15 Regenerative Thermal Oxidizer, A-16 Regenerative Thermal Oxidizer, A-17 Packed Bed Scrubber, and A-18 Packed Bed Scrubber abating S-6 Shredder and S-7 In-feed Conveyor.

1. The owner/operator shall abate emissions from A-11 and A-12 Venturi Scrubbers with A-15 and A-16 Regenerative Thermal Oxidizers during all periods of operation. Combined flow rate shall not exceed 180,000 acfm.
   (~~b~~Basis: Cumulative Increase, BACT/TBACT)

2. The owner/operator shall operate A-15 and A-16 each to meet the following VOC destruction efficiency requirements:
   a. Outlet VOC concentration of 20 ppmv or less; or
   b. All of the following standards depending on the applicable inlet VOC concentration:
   c. VOC destruction efficiency ≥ 98.5% if inlet VOC concentration > 2,000 ppmv;
   d. VOC destruction efficiency > 98% if inlet VOC concentration > 200 to < 2,000 ppmv;
   e. VOC destruction efficiency > 90% if inlet VOC concentration < 200 ppmv.
   (~~b~~Basis: Cumulative Increase; BACT/TBACT)

3. The owner/operator shall operate A-15 and A-16 at a minimum combustion zone temperature of ~~1600~~ 1830 degrees F, averaged over 15-minute period, at all times when the shredder S-6 is operating. The District may adjust this operating temperature limit if source test data demonstrate that alternate values are necessary for or capable of maintaining compliance with Part 2 above.
   (~~b~~Basis: Cumulative Increase; BACT/TBACT)

4. To determine compliance with the temperature requirement in these permit conditions, the owner/operator shall equip A-15 and A-16 each with a temperature measuring device capable of continuously measuring and recording the temperature in each regenerative thermal oxidizer. The owner/operator shall install, and maintain in accordance with manufacturer's recommendations, a temperature measuring device that meets the following criteria: the minimum and maximum measurable temperatures with the device

are 560 degrees F and ~~1750~~1900 degrees F, respectively, and the minimum accuracy of the device over this temperature range shall be 1.0 percent of full-scale.
(~~b~~Basis: Cumulative Increase; BACT/TBACT)

5. The owner/operator shall report any non-compliance with Part 3 of this condition to the Director of the Compliance & Enforcement Division at the time that it is discovered. The submittal shall detail the corrective action taken and shall include the data showing the exceedance as well at the time of occurrence.
(~~b~~Basis: Cumulative Increase, Regulation 2-5)

6 The temperature limit in Part 3 shall not apply during an "Allowable Temperature Excursion", provided that the temperature controller setpoint complies with the temperature limit. 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 are 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.
(~~b~~Basis: Regulation 2-1-403)

7. For each Allowable Temperature Excursion that exceeds 20 degrees F and 15 minutes in duration, the Permit Holder shall keep sufficient records to demonstrate that they meet the qualifying criteria described above. Records shall be retained for a minimum of five (or two years) 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 Allowable Temperature Excursions per month, and total number for the current calendar year; and
e. All strip charts or other temperature records.

(~~b~~Basis: Regulation 2-1-403)

8. The owner/operator shall not use more than 1,332,980 therms combined during any consecutive twelve-month period in A-15 and A-16 regenerative thermal oxidizers.
(~~b~~Basis: Cumulative Increase)

9. The owner/operator shall abate emissions from A-15 and A-16 Regenerative Thermal Oxidizers with A-17 and A-18 Packed Bed Scrubbers during all periods of operation. Exhaust gas flow rate to each Packed Bed Scrubber shall not exceed 90,000 acfm, averaged over a 1-hour period, and liquid flow rate shall be at least 720 gallons per minute, averaged over a 1-hour period. The owner/operator shall maintain an effective pressure differential operating range of 5 to 10 inches of H2O across each packed bed scrubber. The District may adjust these limits if source testing demonstrates that alternate values are necessary for or capable of maintaining compliance with the requirements of this Condition and the particulate emission limits in Condition 27410, Part 3.
(bBasis: Cumulative Increase, BACT/TBACT)

10. The owner/operator shall not emit more than following from A-15 and A-16 Regenerative Thermal Oxidizers at stacks P-17 and P-18:
    a. CO Limit: The owner/operator shall not emit more than 84 pounds of CO per million (MM) scf of fuel burned from either A-15 or A-16.
    b. Standby Mode NOx Limit: When there is no feed material entering the shredder (S-6), the owner/operator shall not emit more than 50 pounds of NOx per MM scf of fuel burned from either A-15 or A-16.
    c. Shredder Operation Mode NOx Limit: When there is feed material entering the shredder (S-6), the owner/operator shall not emit more than 4.23 pounds of NOx per hour from either A-15 or A-16.
    d. Annual NOx Limit: The owner/operator shall not emit more than 9.027 tons of NOx per year in total from A-15 and A-16 combined.

	NOx (lb/MMscf)	CO (lb/MMscf)
A-15	50	84
A-16	50	84

(bBasis: RACT, Cumulative Increase, Source Test Method 13A and Method 6)

11. The owner/operator shall not emit more than the following toxic air contaminants from the exhaust of A-17 and A-18 Packed Bed Scrubbers, combined. , unless the owner/operator complies with all of the procedures and limits in Parts 11a-d:
    a. Within 60 days of receiving source test results demonstrating that total emissions from stack P-17 and P-18 combined exceed any one of the limits in this part, the owner/operator shall submit a permit application to the Air District to request revisions in the TAC emission limits below. The permit application shall include all information required to conduct an updated health risk assessment for the Shredder, Thermal Oxidizers, and Acid Gas Scrubbers, including new proposed emission limits for fugitive emissions from the shredder building and for each stack for the full list of potential TACs for these devices, as identified in Part 13, that also demonstrate compliance with the source test results.

~~b. The health risk assessment for this project shall demonstrate that total health risks resulting from the proposed limits on shredder building fugitive emissions, P-17 emissions, and P-18 emissions do not exceed the lower of (a) a cancer risk limit of 3.0 in a million for this project or (b) the applicable project cancer risk limit identified in Regulation 2, Rule 5. The health risk values shall be evaluated at the Maximally Exposed Individual Resident (MEIR) and Maximally Exposed Individual Worker (MEIW), but not the Point of Maximum Impact (PMI). In addition, the health risk assessment for this project shall demonstrate compliance with any other applicable limits or requirements of Regulation 2, Rule 5.~~

~~c. The health risk assessment shall be conducted in accordance with the Regulation 2-5 procedures in effect at the time the HRA is conducted.~~

~~d. If the health risk assessment for the revised TAC emissions limits for the shredder and its associated abatement equipment find that health risks exceed any of the limits described in Part 11b, the owner/operator shall submit a compliance plan to reduced TAC emissions, change operational parameters, or make other improvements such that the health risk assessment meets the requirements of Part 11b. This compliance plan shall be submitted to the District within 60 days of notification by the District that such a plan is required.~~

Pollutant	**Total Stack Emissions (P-17 + P-18)**
	(lbs/hour)
Acrylonitrile	4.2E-03
Arsenic	1.1E-04 ~~8.2E-06~~
Benzene	2.8E-02 ~~2.4E-02~~
Butadiene, 1,3-	1.1E-03 ~~6.1E-04~~
Cadmium	4.4E-04 ~~5.0E-04~~
Chromium, Hexavalent	1.0E-04 ~~7.8E-05~~
Dioxins/Furans	2.0E-08
Ethyl Benzene	4.4E-02 ~~5.0E-02~~
Lead	3.2E-03 ~~3.2E-03~~
Manganese	1.1E-03
Mercury	3.4E-03
Naphthalene	3.0E-03
Nickel	4.8E-04 ~~1.5E-03~~
PAHs, as benzo(a)pyrene	1.6E-03
PCBs	1.1E-03 ~~3.4E-04~~
Toluene	2.4E-01 ~~2.0E-01~~
Xylenes	2.4E-01

If source testing shows that toxic air contaminant emissions exceed these permit limits, the owner/operator may apply to increase the limits if it can demonstrate that the

increased emissions will not cause health risks exceeding any applicable limits or requirements of Regulation 2, Rule 5, but the owner/operator shall not operate with emissions exceeding these permit limits until revised limits are approved by the Air District. (~~b~~Basis: Regulation 2-5)

12. Not later than 60 days from the startup of A-15 and/or A-16 and annually thereafter, the owner/operator shall conduct source tests to determine ~~initial~~ compliance with the limits in ~~p~~Parts 2 and 10. After [enter PO issue date], the owner/operator shall conduct quarterly source tests for NOx during Shredder Operation Mode to determine compliance with limits in Part 10 c and d. The owner/operator shall submit the source test results to ~~the~~ Air District staff no later than 60 days after the source test. After at least two years of quarterly testing demonstrating continuous compliance with the limits in Part 10 c and d, the owner/operator may submit a permit application to reduce the testing frequency. (~~b~~Basis: Cumulative Increase, Regulation 2-5)

13. Not later than 60 days from the startup of A-15 and/or A-16 and every ~~five~~ two years thereafter, the owner/operator shall conduct source tests to determine compliance with the limits in ~~p~~Part 11. In addition to the compounds identified in Part 11, this source test shall include, as a minimum, the full list of potential TACs for the Shredder, Thermal Oxidizers, and Acid Gas Scrubbers identified below. The owner/operator shall submit the source test results to ~~the~~ Air District staff no later than 60 days after the source test. (~~b~~Basis: Cumulative Increase, Regulation 2-5)

Potential TACs	**Potential TACs**
Acetaldehyde	Perchloroethylene
Arsenic	PCBs
Benzene	Propylene
Beryllium	PAHs (as benzo(a)pyrene)
Butadiene, 1,3-	Selenium
Cadmium	Styrene
Chromium, Hexavalent	Toluene
Cobalt	Vanadium
Copper	Xylenes (mixed)
Ethyl Benzene	o-Xylene
Formaldehyde	Cumene
Hexane	Hexachloroethane (PCA)
Isopropyl Alcohol	Methyl Isobutyl Ketone (MiBK)
Lead	Trimethylpentane, 2,2,4-
Manganese	Acrylonitrile
Methanol	1,1 Dichloroethene
Methyl Chloroform	Carbon Disulfide
Methyl Ethyl Ketone	1,4-Dioxane
Methylene Chloride	1,4-Dichlorobenzene

Potential TACs	**Potential TACs**
Mercury	Hydrogen Fluoride
Naphthalene	Hydrogen Chloride
Nickel	
Polychlorinated Dibenzo-p-Dioxins (PCDDs), Polychlorinated Dibenzo Furans (PCDFs), and Dioxin-like PCBs*	

* This is a large group of compounds with different toxic equivalency factors (TEF) values as listed in Table 2-5-1.

14. The owner/operator shall comply with all applicable testing requirements as specified in Volume V of the District's Manual of Procedures. 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.
(~~b~~Basis: Cumulative Increase, Regulation 2-5)

15. In order to demonstrate compliance with the above parts of this permit condition, the owner/operator shall maintain the following monthly records in a District-approved log for at least 24 months from the date of entry. Log entries shall be retained on-site and made available to District staff upon request:
    a. Monthly quantity of Natural Gas Consumed in A-15 and A-16 combined.
    b. Monthly quantities shall be totaled for each consecutive twelve-month period.
    c. All source test records required per Parts 12 and 13.
    (~~b~~Basis: Cumulative Increase)

End Conditions

Condition # 27410
This permit condition became effective upon the installation and start-up of the Regenerative Thermal Oxidizers (A-15 and A-16) and the Packed Bed Scrubbers (A-17 and A-18).

S-6 Shredder and S-7 Infeed Conveyor; abated by A-6 Water Sprays, A-11 Venturi Scrubber, A-12 Venturi Scrubber, A-15 Regenerative Thermal Oxidizer, A-16 Regenerative Thermal Oxidizer, A-17 Packed Bed Scrubber, and A-18 Packed Bed Scrubber.
(Revision 1: A #14194, 6/16/06; Revision 2: A #16721, 4/9/09; Revision 3: A #27762, 11/10/16; Revision 4: A #27762, 11/20/2020, Revision 5: A #30009, 8/26/2021; Revision 6: A #30009, 3/2/2022, ~~12/30/2022~~ [enter PO issue date])

1. The owner/operator shall not exceed the scrap-in throughput limit of 720,000 tons in any calendar year at this facility.

(Basis: Regulations 2-1-301–- baseline 2005 production level of 431,471 tons/year–- and 2-5-302 and Cumulative Increase for the incremental throughput)

2. The owner/operator shall enclose the shredder, S-6, and shall vent the captured shredder emissions to the Venturi Scrubbers, A-11 and A-12, followed by Regenerative Thermal Oxidizers, A-15 and A-16, followed by Packed Bed Scrubbers, A-17 and A-18, during all times that S-6 is operating. The owner/operator shall minimize fugitive emissions from the shredder enclosure during shredder operation by meeting the following requirements:

a. maintaining and following an operating and maintenance plan for the shredder enclosure and associated equipment and keeping records of all monitoring, inspections, maintenance, and repair events;

b. ~~(a) designing the enclosure such that the total surface area of all openings in the enclosure does not exceed 5% of the total surface area of the enclosure walls, floor, and ceiling~~ closing the following openings prior to shredder operation: rubber roll-up door (N-2) in the north face, steel door (E-1) in the east face, personnel door (S-1) in the south face, and steel door (S-3) in the south face;

c. ~~(b)~~ using and maintaining blast curtain walls or strip curtains on the inlet feed conveyor opening and on all partial openings in the east and south faces of the enclosure; ~~and~~inspecting the enclosure, curtain walls and strip curtains on a monthly basis; repairing or replacing damaged curtain materials within 7 days of discovery; and repairing any damages to the enclosure within 14 days of discovery;

d. ~~(c) ensuring that the ventilation fan is operating within its design range.,~~ operating the ventilation fans such that the average amperage for the two fans is at least 82 amperes, averaged over a 1-hour period, during shredder operation; and monitoring and recording fan amperes at least once per 15-minute period during shredder operation;

e. identifying a minimum of 4 Air-District approved locations for monitoring air flow direction and pressure drop during shredder operation; verifying that air is flowing into the enclosure at each enclosure monitoring location once per operating day; monitoring for pressure drop once per operating day at each monitoring location; maintaining an average pressure drop of at least 0.007 inches of water averaged over all enclosure monitoring locations; maintaining records of all pressure drop measurements.

~~The owner/operator shall operate each Venturi Scrubber in accordance with manufacture specifications. The owner/operator shall demonstrate this by maintaining a minimum water flow rate of 260300 gallons per minute (gpm), averaged over a 1-hour period, to each venturi scrubber and an effective pressure differential operating range 15-22 inches of H2O across each venturi scrubber, averaged over a 1-hour period. The District may adjust these operating parameter limits if source test data demonstrates that alternate values are necessary for or capable of maintaining compliance with the particulate emission limits in Part 3.~~

(Basis: Regulation 2, Rule 5 Project Risk Limits and TBACT)

3. Total emissions from the S-6 Auto Shredder shall not exceed any of the emission limits listed below:

   a. Maximum Permitted Emission Rates:

	P-17 and P-18 Pounds/Hour Per Stack	P-17 and P-18 Tons/Year Per Stack
PM10 (total filterable + condensable)	3.11	3.32
POC (calculated as methane)	2.74	2.55

   b. Total particulate emissions from stacks P-17 and P-18 shall not exceed a grain loading of 0.0048 grains/dscf in each stack as determined in accordance with Regulation 6-1-602.1.

   c. The owner/operator shall demonstrate compliance with the Part 3a stack emission limits as described in Part 4.

d. The owner/operator shall operate each Venturi Scrubber in accordance with manufacturer specifications. The owner/operator shall maintain a minimum water flow rate of 260~~300~~ gallons per minute (gpm), averaged over a 1-hour period, to each venturi scrubber and an effective pressure differential operating range of 15 to 22 inches of H2O across each venturi scrubber. The District may adjust these operating parameter limits if source test data demonstrates that alternate values are necessary for or capable of maintaining compliance with the particulate emission limits in Part 3.

(Basis: Cumulative Increase, BACT, TBACT, and Regulations 2-5-302 and 8-2-301)

4. Source Testing Requirements for Part 3:

   a. The owner/operator shall conduct quarterly monitoring for the total carbon concentration in stacks P-17 and P-18, using authorized procedures and methods, to demonstrate compliance with Part 3a and Regulation 8-2-301. This quarterly monitoring shall continue until an organic abatement system is operating and continued compliance with Regulation 8-2-301 has been demonstrated.

   b. On an annual basis, unless noted otherwise, the owner/operator shall conduct a District approved source test at stacks P-17 and P-18, while the S-6 Auto Shredder is operating at or near the maximum operating rate, to demonstrate compliance with the stack emission limits in Parts 3a-b and Regulation 8-2-301. The owner/operator shall record the shredder processing rate, the water application rates for the infeed conveyor and the shredder, the water flow rates and the pressure differential operating ranges at each venturi scrubber and at each packed bed scrubber, and the ventilation fan amperage during the source test. The source test shall determine the hourly emission rate and the average emission

factor (pounds of pollutant per ton of material processed by the shredder) for the following compounds:

- total carbon (calculated as methane and as defined in Regulation 8-2-202) shall be determined by Air District approved methods, such as EPA Methods 25A and 18,
- total POC (calculated as methane), where total POC = total carbon (excluding methane only) – total NPOC. Total NPOC (calculated as methane) shall be determined by Air District approved methods, such as EPA Method 18 and EPA Method TO-15 or other similar GC/MS methods. Total NPOC is the sum of all NPOCs (other than methane) identified in Regulation 2-1-207, expressed as methane.
- total particulate emissions shall be determined using EPA Method 5/202. All measured total particulate emissions shall be assumed to be PM10 for comparison to the limits in Part 3a.
- Full speciation of organic TACs shall be determined by Air District approved methods, such as EPA Method TO-15 or other similar GC/MS methods.
- PCBs shall be determined by Air District approved methods, such as CARB Method 428. (This test shall be conducted ~~within 90 days of Permit to Operate issuance and~~ once every ~~four~~ two years ~~thereafter~~.)
- PAHs and naphthalene shall be determined by Air District approved methods, such as CARB Method 429. (This test shall be conducted ~~within 90 days of Permit to Operate issuance and~~ once every ~~four~~ two years ~~thereafter~~.)
- Full set of metal TACs (including arsenic (As), beryllium (Be), cadmium (Cd), chromium (Cr) which includes total chromium and hexavalent chromium (Cr VI), cobalt (Co), copper (Cu), lead (Pb), manganese (Mn), mercury (Hg), nickel (Ni), and selenium (Se)), shall be determined using Air District approved procedures for each compound, including CARB Method 425 for hexavalent chromium. (This test shall be conducted ~~within 90 days of Permit to Operate issuance and~~ once every ~~four~~ two years ~~thereafter~~.)
- Dioxin and furans shall be determined by Air District approved methods, such as EPA Method 23/23A.
- Annual emissions for each stack shall be calculated based on the most recent 12-month shredder feedstock throughput rate and the pounds/ton emission factors determined by the most recent source test for total POC and total particulate emissions. Annual stack emission rates shall be compared to the Part 3a limits.

The annual source test shall also determine the outlet grain loading and the concentration of total carbon in stacks P-17 and P-18 to demonstrate compliance with Part 3b Regulation 8-2-301 using Air District approved methods.

c. The owner/operator shall submit a source test protocol and notification of the scheduled source test date to the Air District's Source Test Section Manager and to the Permit Engineer at least 30 days prior to the scheduled test date.
d. The owner/operator shall notify the Source Test Section Manager of any changes to the scheduled test date as soon as possible.
e. The owner/operator shall submit a copy of the source test report to the Source Test Section Manager and the Permit Engineer within 60 days of the test date.

(Basis: Cumulative Increase, TBACT and Regulations 2-5-302 and 8-2-301)

5. The owner/operator shall apply water sprays (A-6) at the shredder, S-6, and infeed conveyor, S-7, at sufficient rates to ensure that non-metallic material exiting the sources is moist to the touch at all times of operation.
(Basis: Cumulative Increase, TBACT; and Regulation 2-5-302)

6. The owner/operator shall operate the Recycling Center in such a manner that particulate emissions into the atmosphere from any operation/equipment for a period or periods aggregating more than three minutes in any hour shall not cause a visible emission which is as dark or darker than No. 0.5 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree or result in fallout on adjacent property in such quantities as to cause public nuisance per District Regulation 1-301.
(Basis: Regulations 1-301 and 6-1-301)

7. The owner/operator shall use water spray to minimize fugitive dust emissions from material/scrap handling and storage to comply with Part 6. The owner/operator shall operate the facility at all times in accordance with its approved Emissions Minimization Plan (EMP).
(Basis: Regulations 1-301, 6-1-301, and 6-4-301)

8. The owner/operator shall not exceed a total of 26 ship calls and 63,875 truck calls per calendar year to haul in/out scrap/materials at the facility.
(Basis: health risk assessment for CEQA review)

9. In order to demonstrate compliance with Parts 1 and 8, the owner/operator shall keep records of monthly and yearly throughput of shredder feedstock materials, ship calls and truck calls in a District approved log. Shredder feedstock shall be totaled for each consecutive rolling 12-month period. All records shall be maintained for a period of at least 5 years from the date of data entry and shall be made available to Air District staff for inspection upon request.
(Basis: Regulations 2-1-301 and 2-5-302, Cumulative Increase, CEQA)

End Conditions

VIII. PROPOSAL TO ISSUE PERMIT TO OPERATE

The Air District is initiating a public notice process for this proposed Permit to Operate issuance. After considering all comments received, the Air District will make a final determination on issuing Schnitzer a Permit to Operate for the following abatement devices, subject to Condition # 27348 with the revisions noted above.

A-**15 Regenerative Thermal Oxidizer, 21 MMBTU/hr; to abate A-11 Venturi Scrubber**

A-16 Regenerative Thermal Oxidizer, 21 MMBTU/hr; to abate A-12 Venturi Scrubber

A-17 Packed Bed Scrubber; abating A-15 Regenerative Thermal Oxidizer

A-18 Packed Bed Scrubber; abating A-16 Regenerative Thermal Oxidizer

After considering all comments received, the Air District will also make a final determination on issuing Schnitzer a Permit to Operate for the S-6 Metal Shredder, subject to Condition # 27410 with the revisions noted above.

S-6 Metal Shredder; abated by A-11 and A-12 Venturi Scrubbers, A-15 and A-16 Regenerative Thermal Oxidizers, and A-17 and A-18 Packed Bed Scrubbers.

Prepared By: _____ _____
Davis Zhu, Senior Air Quality Engineer Date

Reviewed By: _____ _____
Kevin Oei, Supervising Air Quality Engineer Date

_____ _____
Carol Allen, Engineering Manager Date

Appendix A

Health Risk Assessment

For

S-6 Metal Shredder and Abatement Systems