ATTACHMENT E:

Reasonably Available Control Measure Analysis

VOC AND NO_X REASONABLY AVAILABLE CONTROL MEASURES (RACM) ANALYSIS FOR HYDROGRAPHIC AREA (HA) 212

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1.0 INTRODUCTION

Section 172(c)(1) of the Clean Air Act requires states to implement reasonably available control measures ("RACM") to assure that a nonattainment area attains the NAAQS as expeditiously as practicable. Specifically, the Act states:

> [i]n general – Such plan provisions shall provide for the implementation of all reasonably available control measures as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology) and shall provide for attainment of the national primary ambient air quality standards [42 U.S.C. § 7502(c)(1)].

EPA has not identified a specific set of control measures that qualify as RACM: "Under EPA's policy concerning RACM there are no measures that are automatically deemed RACM" (70 FR 71660). Instead, EPA recognizes that the requirement for RACM relates to the requirement to achieve attainment of the NAAQS. EPA determined that it may approve any SIP submittal lacking specific RACM control measures if the state demonstrates "(a) that reasonable further progress and attainment of the NAAQS are assured, and (b) that application of all RACM would not result in attainment any faster..." (44 FR 20372, 20375). Several courts have upheld EPA's interpretation of the RACM requirement (e.g., *Sierra Club v. EPA,* 314 F. 3d 735 (5th Cir. 2002) and *Sierra Club* v. *EPA,* 294 F. 3d 155 (D.C. Cir. 2002)).

2.0 IDENTIFYING RACM CONTROL MEASURES

RACM includes the emissions controls necessary to meet reasonable further progress (RFP) requirements and bring an area into attainment as expeditiously as practicable. Such control measures can include control of point, area, onroad, and/or nonroad emission sources. To qualify as RACM, EPA considers whether the control measure meets five criteria. The control measures should:

- Be technologically feasible;
- Be economically feasible;
- Not result in "substantial widespread and long-term adverse impacts";
- Not be "absurd, unenforceable, or impracticable"; and
- "[A]dvance the attainment date by at least one year" (74 FR 2945, 2951).

In identifying available control measures, state and local air pollution control agencies consider applying control measures emissions sources inside or outside the nonattainment area if emissions reductions from the wider geographic area reduce ozone concentrations within the nonattainment area.

RACM measures can reduce either VOC or NO_x emissions. However, if emissions reductions of one of these pollutants will not contribute to attainment, then available control measures for that pollutant need not be considered in the RACM analysis: "If a state demonstrates that implementation of VOC emissions reduction measures will not contribute to an area's reasonable

further progress or to attainment, then additional control of VOC emissions does not need to be further considered for RACM purposes" (80 FR 12264).

Additionally, a state or local air pollution control agency need not consider control measures for emissions sources that will not lead to a decrease in the ambient air concentration of ozone. EPA has determined that where an emissions source contributes "'only negligibly' to ambient concentrations that exceed the NAAQS," applying a control measure to the emissions source is not reasonable (57 FR 13498, 13540).

Finally, in identifying potential control measures, a state and local air pollution control agency should consider "...the time needed to analyze, develop, and implement the measure" (44 FR 20372, 20375). If a control measure is available, but implementation of the measure in the nonattainment area could not occur on a schedule that would achieve or advance the area's attainment date, then "EPA would not consider it reasonable to require implementation of such measures" (57 FR 13498, 13560). To advance the area's attainment date, the measure must provide emissions reductions such that the nonattainment area would achieve attainment one year sooner (e.g., 40 CFR § 51.1004(a)(1)(i)).

3.0 METHODOLOGY FOR RACM ANALYSIS FOR HA 212

The purposes of a RACM analysis are to (1) identify control measures necessary to meet reasonable further progress and attainment by an area's attainment date, and (2) determine whether additional control measures exist that would advance the attainment date by one year. Control measures meeting one of these criterion are considered reasonably available.

3.1 Pollutants Considered

RTP considered both NO_x and VOC emissions reduction control measures for RACM. The attainment modeling shows HA 212 includes a balanced mix of NO_x and VOC sensitive ozone production on the top 10 simulated days at the highest modeled design value monitoring site (Joe Neal). There are also substantial variations in day-to-day sensitivities. This means that, in the near term, ambient air concentrations of ozone should respond to either VOC or NO_x emissions reductions – making reductions in either pollutant a candidate for effective contingency measures (DES, 2024e).

3.2 Control Measures Evaluated

RTP developed a list of potential NO_x control measures using EPA's Menu of Control Measures for NAAQS Implementation (available at: Menu of Control Measures for NAAQS Implementation | US EPA), and considered transportation control measures (TCMs) and control measures reviewed in other state RACM plans (EPA, 2022). The Menu of Control Measures provides a broad listing of potential emissions reduction measures for reducing NO_x and VOC emissions. DES also consulted with the Regional Transportation Commission of Southern Nevada to identify potential TCMs that could be applied in the area to reduce mobile source emissions, and provided this information to RTP.

For VOC, most of the control measures listed on EPA's Menu of Control Measures included

VOC RACT CTGs, which RTP already thoroughly evaluated in the CTG Reasonably Available Control Technology Analysis (DES, 2024c). For this reason, RTP conducted no additional evaluation of EPA's Menu of Control Measures for VOC. Instead, RTP identified potential VOC control measures based on SCC with emissions reported in the inventories above a 0.10 tpd VOC threshold.

DES then reviewed state regulations and state RACM analyses to identify potential control measures for these categories, listed in Table 1.

Table 1. Nonpoint Source Categories with Greater than 0.01 tpy VOC Emissions in 2015 Ozone NAAQS SIP Inventory

SCC	SCC Description
2680003000	Waste Disposal, Treatment, and Recovery; Composting; 100% Green Waste (e.g., residential or municipal yard wastes); All Processes
2501012013	Storage and Transport; Petroleum and Petroleum Product Storage; Commercial Portable Gas Cans; Spillage During Transport
2461800000	Solvent Utilization; Miscellaneous Non-industrial: Commercial; Pesticide Application: All Processes; Total: All Solvent Types
2610000500	Waste Disposal, Treatment, and Recovery; Open Burning; All Categories; Land Clearing Debris (use 28-10-005-000 for Logging Debris Burning)
2501011013	Storage and Transport; Petroleum and Petroleum Product Storage; Residential Portable Gas Cans; Spillage During Transport
2501011012	Storage and Transport; Petroleum and Petroleum Product Storage; Residential Portable Gas Cans; Evaporation (includes Diurnal losses)
2501012014	Storage and Transport; Petroleum and Petroleum Product Storage; Commercial Portable Gas Cans; Refilling at the Pump - Vapor Displacement
2501011011	Storage and Transport; Petroleum and Petroleum Product Storage; Residential Portable Gas Cans; Permeation
2302002200	Industrial Processes; Food and Kindred Products: SIC 20; Commercial Cooking - Charbroiling; Under-fired Charbroiling
2501012012	Storage and Transport; Petroleum and Petroleum Product Storage; Commercial Portable Gas Cans; Evaporation (includes Diurnal losses)
2501012011	Storage and Transport; Petroleum and Petroleum Product Storage; Commercial Portable Gas Cans; Permeation

Finally, RTP also reviewed a spreadsheet prepared by Ramboll U.S. Consulting, Inc. for DES, which identifies potential controls and estimates cost effectiveness and emissions reductions for certain control measures, and used this information in preparing the RACM analysis (Ramboll, undated).

In Section 5.0, Tables 2 and 3 identify potential onroad and offroad TCMs, while Table 4 identifies potential control measures for NOx and Table 5 identifies potential VOC control measures.

3.3 Estimating Emissions Reductions and Cost Effectiveness

After identifying potential control measures, RTP considered the degree of emissions reductions that could result from implementing the control. RTP used the 1997 ozone NAAQS second maintenance plan 2023 emissions inventory (DES, 2021) to estimate emissions reductions for

point sources, and the 2023 estimates in the 2015 Ozone NAAQS SIP Inventory (DES, 2024a) for nonpoint sources and other categories. (The full 2015 Ozone NAAQS SIP Inventory was not yet available at the time of the analysis).

If the emission inventories included emissions that might be controlled by a potential measure, then RTP presumed the measure is technically feasible for purposes of this RACM evaluation. If estimated cost effectiveness for an available control measure is less than $5,500/ton, then RTP considered the measure potentially cost effective. RTP did not consider whether some or all the emissions in the inventory are already meeting some level of emissions control and assumed no existing control. Also, there are multiple available control options for some source categories; RTP generated the emissions reduction estimates assuming no overlap in the available emissions controls. If emissions, in fact, are already controlled, then this impacts the cost effectiveness conclusions.

In identifying potential emission reductions from the inventories, RTP eliminated individual point sources reporting less than 0.003 tpd NO_x or 0.10 tpd VOC. These source emissions are negligible sources of emissions and unlikely to be cost effective to control. After grouping individual point or nonpoint sources together, RTP also eliminated groupings collectively reporting less than 0.10 tpd of NO_x or VOC, because these emissions are also negligible and unlikely to be cost effective to control (MDE, undated).

The only point source categories meeting the VOC threshold are SCC 20200102 (generators), and SCC 50410312 (thermal oxidizers). The generators will be subject to major source VOC CTG RACT requirements and RTP determined that no additional controls measures are cost effective in the major source RACT analyses (DES, 2024d). Thermal oxidizers are a VOC emissions control measure, and therefore, no additional control measure is appropriate for this type of VOC emissions unit. For nonpoint source emissions, DES identified several SCC codes that met the VOC threshold, that also were not otherwise regulated by a RACT requirement. These categories are listed in Table 1 in Section 3.2.

To estimate emissions reductions from identified control measures, RTP assigned 2023 summer day NO_x emissions by source classification code (SCC) to potential control measures for that emissions type. In some cases, RTP grouped similar equipment from different SCC together and assigned those emissions to a single control option. RTP used control efficiency provided in by EPA to estimate emissions reductions for a control measure (EPA, 2022), when available, in some cases, relied on previous estimates provided by Ramboll US Consulting Inc (Ramboll, undated), and in others researched methods for computing cost and emissions reductions.

When RTP could estimate potential emissions reductions, the “RACM Conclusions” column includes this estimate. If a control measure is associated with emissions sources that RTP determined were negligible, then DES determined that an emissions control measure is not cost effective irrespective of the stated cost-per-ton (cost effectiveness) reported for the control measure.

4.0 RACM ANALYSIS FINDINGS

DES cannot implement any potential control measure identified in Section 5.0, Tables 2-5 in time to advance the attainment date by one year. EPA requires that ozone control measures be implemented, and attainment be modeled, for the last full ozone season preceding the attainment date. The attainment date for HA 212 is August 3, 2024. Ozone attainment by this date will be determined using a 3-year average of the annual fourth-highest daily maximum ozone concentrations. For the August 3, 2024 attainment date, this 3-year period was 2021–2023. To advance the attainment date by a year (to August 3, 2023), EPA would rely on the 3-year average of the annual fourth-highest daily maximum ozone concentrations for the years 2020–2022. Accordingly, for measures to advance attainment to 2023, DES would have had to adopt control measures and have these measures in effect no later than December 31, 2022. This date occurred before EPA reclassified HA 212 to moderate nonattainment.

In addition, sensitivity modeling conducted to support an interprecursor trading ratio showed that, in the near term, although both precursor have some effect on ozone ambient air concentrations, VOC emissions are more effective in reducing the concentration in HA 212 than NO_x reductions (DES, 2024e). The source apportionment modeling study further suggests that external, uncontrollable factors significantly impact ambient ozone concentrations in HA 212, including natural emissions (i.e., biogenic, lightning, oceanic sources), international transport, and transport of anthropogenic emissions from upwind California monitoring sites located over the Mojave Desert, and that imposition of local control measures will have a negligible effect on HA 212's ozone design value concentration and ability to reach attainment. Specifically, the attainment modeling showed that a 15.13 tpd VOC emissions reduction from local control measures would only reduce HA-212's design value concentration by only 0.02 ppb (DES, 2024d). RTP did not identify additional local control measures that would produce this amount of tpd VOC emissions reduction, and even if such control measures were identified and implemented in the near term, the 0.02 ppb change in ozone ambient air concentrations would not be sufficient for HA 212 to reach attainment.

In summary, RTP identified no additional control measures that could advance the attainment date by at least one year. Even if such control measures existed, it is also not feasible to implement the control measures to advance the attainment date by at least one year, because such measure could not be adopted and put into effect before December 31, 2022. Therefore, there are no control measures that satisfy the RACM criteria. RTP recommends that DES continue to evaluate the technical and economic feasibility of these control measures for other purposes (e.g., contingency measures).

5.0 RACM CONCLUSIONS FOR POTENTIAL RACM CONTROL MEASURES

Table 2. Potential Transportation Control Measures for NO_X and VOC Emissions Reductions

Sector	Control Measure	Cost Effectiveness ($/ton)	RACM Conclusion
Gasoline-Passenger Vehicles	Reformulated Gasoline Passenger Vehicles	$3,613	This measure might reduce NOx by 0.58 tpd and VOC by 1.52 tpd. There are supply chain issues that raise the technical feasibility of implementing this control measure. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
Diesel - Heavy Duty Haul Trucks	Fuel Composition Requirements	$50,000	This measure might reduce NOx by 0.07 tpd, but is not cost effective. The measure is not necessary for attainment and cannot advance the moderate area attainment date.
Light Duty Gasoline and Diesel Vehicles	Zero Emissions Vehicle Incentive Program	$17,000-$340,000	NDEP has already adopted this measure.
Heavy Duty Gasoline and Diesel Vehicles and Buses	Accelerate Fleet Turnover/Retrofit Requirements	$3,822	The measure might reduce NOx by 0.22 tpd. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Gasoline Vehicles	Petition EPA to remove 1 PSI Allowance for 9-10% Ethanol Blends	unknown	This measure might reduce VOC emissions by 0.49 tpd. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
Gasoline Vehicles	Low RVP Fuel	$5700/ton	This measure might reduce VOC emissions by 0.004 tpd; but this control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
Heavy Duty Haul Trucks - Diesel	Reduce Idling	$15,751	This measure might reduce NOx emissions by 0.162 tpd and VOC emissions by 0.018 tpd. This control measure is not cost effective; is not necessary for attainment and cannot advance the moderate area attainment date.
Heavy Duty Haul Trucks - Diesel	Aerodynamic Tires and Devises; or low rolling resistance tires and retread tire technologies	$17,000	This measure might reduce NOx emissions by 0.002 to 0.20 tpd; this measure is not cost effective; is not necessary for attainment and cannot advance the moderate area attainment date.
Refuse Collection Trucks	Alternative Fuels	$25,000	This measure might reduce NOx emissions by 0.02 tpd; this measure is not cost effective; is not necessary for attainment and cannot advance the moderate area attainment date.

Sector	Control Measure	Cost Effectiveness ($/ton)	RACM Conclusion
Heavy Duty Haul Trucks - Diesel	Truck Stop Electrification	$10,000-$15,000 per parking space for standalone system; $2500 per parking space for shore power system; $4000 per truck (Centralina, 2007)	This control measure might reduce VOC emissions by 0.0004 tpd VOC and NOx emissions 0.003 tpd emissions reductions per truck parking spot. With an average truck stop having 145 parking spots and 23 hours of use, this control measure could result in 0.05 tpd VOC and 0.42 tpd NOx per truck stop. The economic feasibility of this control measure is not known. Implementation would take at least 1 year. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Heavy Duty Haul Trucks - Diesel	Ultra-low NOx Engine Replacement	Unknown	This measure might reduce NOx emissions by 0.68 tpd. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Diesel School Buses	Idle Reduction	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Diesel School Buses	Electrification	>$30,000	This measure might reduce NOx emissions by 0.16 tpd/per bus. This measure costs $400,000 per school bus. (EPA, 2024) Costs may be offset by grants but it is likely that the measure remains not cost effective. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Commuters	New or Expanded Mobility Services	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Commuters	Education and Outreach	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Gasoline and Diesel Onroad Vehicles	Traffic Signal Optimization	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Diesel Buses	Conversion of Public Transit Fleet Cleaner Fuels	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.

Sector	Control Measure	Cost Effectiveness ($/ton)	RACM Conclusion
Commuter	FlexRide On-demand Service	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Gasoline and Diesel Vehicles	Roadway and Congestion Pricing	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Gasoline and Diesel Vehicles	Enhanced I/M	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
`Gasoline and Diesel Vehicles	Auto Technician Training	Unknown	This control measure has already been implemented. Chapter 445B.700-835 of the Nevada Revised Statutes and Nevada Administrative Code includes an auto technician training and certification program.
Gasoline and Diesel Vehicles	Alternative Fuels for Gov't Fleet	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Gasoline Service Stations	Low Permeation Fuel Hoses	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Gasoline Service Stations	Dripless Gasoline Nozzles	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Heavy Duty Haul Trucks - Diesel	Encourage Truck Fleet Efficiencies	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Heavy Duty Haul Trucks - Diesel	Auxiliary Power Units to Reduce Truck Idling	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Diesel Vehicles	Expand use of Biodiesel Fuel	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot

Sector	Control Measure	Cost Effectiveness ($/ton)	RACM Conclusion
			advance the moderate area attainment date.
Gasoline and Diesel Vehicles	Reduce VOC content in Windshield Wiper Fluid – below 35%	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Fleet Buses	Electrify Tour Buses	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Commuters	Free Transit Passes	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Fleet Buses	Dedicated Bus Lanes for Faster Travel	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Commuters	Rail lines from Airport to Strip	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Commuters	Underwrite Vanpool Insurance	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Commuters	Pay As You Go Auto Insurance ($/gallons)	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Commuters	Park and Ride Lots	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Commuters	Bike/Pedestrian Paths and Locker facilities	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.

Sector	Control Measure	Cost Effectiveness ($/ton)	RACM Conclusion
Gasoline and Diesel Vehicles	Shift Rush Hour by 30 minutes	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Gasoline and Diesel Vehicles	Eliminate/Reduce Drive Through Fast Food or Set Service Guidelines to Reduce Idling	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Gasoline and Diesel Vehicles	Reduce Speed Limits	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
All Vehicles	"Cash for Clunkers" Passenger Cars, Taxis and Buses	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Heavy Duty Haul Trucks - Diesel	Diesel Engine Chip Reflash/OTC Measure	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Gasoline Vehicles	Low Income Vehicle Repair Assistance	Unknown	This control measure has already been implemented. The Smog Free Clark County Voucher Program will pay for emissions-related repairs, up to $975, on 1968-1999 model year vehicles based on income eligibility criteria.
Airport	Regulate Disposal of Fuel Samples from Preflight Checks at Airport	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Gasoline Vehicles	Hydrogen Fueled Vehicles	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
All Vehicles	Implement Advanced Highway Incident Management System	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Heavy Duty Haul Trucks - Diesel	Automatic Tire Inflation Systems	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot

Sector	Control Measure	Cost Effectiveness ($/ton)	RACM Conclusion
			advance the moderate area attainment date.
Heavy Duty Haul Trucks - Diesel	Improved Freight Logistics	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Heavy Duty Haul Trucks - Diesel	Low Viscosity Lubricants	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Heavy Duty Haul Trucks - Diesel	Reduce Truck Weight Limits	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Heavy Duty Haul Trucks - Diesel	Truck Cab or Bunk Heaters/AC	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
All Vehicles	Mandate Automatic Engine Stop-Start Controls	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Fleet Vehicles	Transit Fleet Cleaner Fuels	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Commuters	TDM Program Expansion – free transit passes	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
All Vehicles	Enhanced Integration of Land Use and Transportation Planning	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
Commuters	RTC Smart Trips – service to promote alternative transportation	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.

Sector	Control Measure	Cost Effectiveness ($/ton)	RACM Conclusion
Gasoline and Diesel Passenger Cars	Game Day Express – Service to Stadium	Unknown	This measure is technically feasible. The economic feasibility of the measure is unknown. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.

Table 3. Potential Nonroad Source VOC and NOx Emissions Control Measures

Sector	Control Measure	Cost Effectiveness ($/ton)	RACM Conclusion
Off-highway equipment - Gasoline/LPG/CNG	Reformulated Gasoline (RFG)	Unknown	This measure might reduce NOx emissions by 0.87 tpd and VOC emissions by 2.16 tpd. This economic feasibility of this control measure is unknown. This control measure is not necessary for attainment and cannot advance the attainment date.
Off-highway equipment - Diesel	Repowering Engines/Retrofits	$4,500	This measure might reduce NOx emissions by 0.31 tpd and VOC emissions by 0.005 tpd. This control measure is not necessary for attainment and cannot advance the attainment date.
Offroad Engines - Diesel	Tier II Engine Replacement to Tier III or IV	$43, 493	This measure might reduce NOx emissions by 0.110 tpd. This is not cost effective. This control measure is not necessary for attainment and cannot advance the attainment date.
Offroad Construction, Industrial and Airport Equipment	Engine Replacement to Tier IV	$16,000	This measure might reduce NOx emissions by 1.55 tpd. This control measure is not cost effective. This control measure is not necessary for attainment and cannot advance the attainment date.
Off-highway Construction and Agriculture Equipment	Electrification	Unknown	This measure might reduce NOx emissions by 0.151 tpd and VOC emissions by 0.02 tpd. The economic feasibility of this measure is unknown. This control measure is not necessary for attainment and will not advance the attainment date.
Off-highway Construction and Agriculture Equipment	Biodiesel	Unknown	The economic feasibility of this measure is unknown. This control measure is not necessary for attainment and cannot advance the attainment date.

Sector	Control Measure	Cost Effectiveness ($/ton)	RACM Conclusion
Off-highway Construction and Agriculture Equipment	Cap and Trade	Unknown	The economic feasibility of this measure is unknown. This control measure is not necessary for attainment and cannot advance the attainment date.
Small Offroad Engines	Electrification or Low emitting Engines	$16,000	This measure might reduce NOx emissions by 0.015 tpd and VOC emissions by 0.153 tpd. The measure is not cost effective. This control measure is not necessary for attainment and cannot advance the attainment date.
Locomotives	Upgrade Engines in Switcher Locomotives - Diesel-Electric Hybrid Locomotives	$12, 250	This measure is not cost effective; is not needed for attainment; and will not advance the moderate area attainment date.

Table 4. Analysis of Potential Point and Nonpoint Source NO_X Control Measures for Clark County

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
	NonEGU Point	Adipic Acid Manufacturing	Extended Absorption	86	$156	No sources operating in Clark County.
	NonEGU Point	Adipic Acid Manufacturing	Thermal Reduction	81	$728	No sources operating in Clark County.
	NonEGU Point	Ammonia - NG-Fired Reformers	Low NOx Burner and Flue Gas Recirculation	60	NOX < 365 tpy: $4,440 NOX > 365 tpy: $1,023	No sources operating in Clark County.
	NonEGU Point	Ammonia - NG-Fired Reformers	Low NOx Burner	50	NOX < 365 tpy: $1,422 NOX > 365 tpy: $937	No sources operating in Clark County.
	NonEGU Point	Ammonia - NG-Fired Reformers	Selective Catalytic Reduction	90	$3,421	No sources operating in Clark County.
	NonEGU Point	Ammonia - NG-Fired Reformers	Selective Non-Catalytic Reduction	50	NOX < 365 tpy: $6,711 NOX > 365 tpy: $2,723	No sources operating in Clark County.
	NonEGU Point	Ammonia - Oil-Fired Reformers	Low NOx Burner and Flue Gas Recirculation	60	NOX < 365 tpy: $1,942 NOX > 365 tpy: $676	No sources operating in Clark County.
	NonEGU Point	Ammonia - Oil-Fired Reformers	Low NOx Burner	50	NOX < 365 tpy: $694 NOX > 365 tpy: $746	No sources operating in Clark County.
	NonEGU Point	Ammonia - Oil-Fired Reformers	Selective Catalytic Reduction	80	NOX < 365 tpy: $2,567 NOX > 365 tpy: $1,405	No sources operating in Clark County.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
	NonEGU Point	Ammonia - Oil-Fired Reformers	Selective Non-Catalytic Reduction	50	NOX < 365 tpy: $4,474 NOX > 365 tpy: $1,821	No sources operating in Clark County.
	NonEGU Point	Ammonia Prod; Feedstock Desulfurization	Low NOx Burner and Flue Gas Recirculation	60	NOX < 365 tpy: $4,440 NOX > 365 tpy: $1,023	No sources operating in Clark County.
30500205, 30500206	NonEGU Point	Asphaltic Conc; Rotary Dryer; Conv Plant	Low NOx Burner	50	NOX < 365 tpy: $3,815 NOX > 365 tpy: $3,122	Emissions from this source category are negligible and therefore the control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	By-Product Coke Mfg; Oven Underfiring	Selective Non-Catalytic Reduction	60	$2,844	No sources operating in Clark County.
30500606, 30500620, 30500622	NonEGU Point	Cement Manufacturing - Dry	Selective Catalytic Reduction	90	$6,703	No sources operating in Clark County.
	NonEGU Point	Cement Manufacturing - Dry	Selective Non-Catalytic Reduction - Ammonia	50	$1,474	No sources operating in Clark County.
	NonEGU Point	Cement Manufacturing - Dry	Selective Non-Catalytic Reduction	50	$1,335	No sources operating in Clark County.
	NonEGU Point	Cement Manufacturing - Dry2	Selective Catalytic Reduction	85	$5,844	No sources operating in Clark County.
30500606	NonEGU Point	Cement Manufacturing - Wet	Selective Catalytic Reduction	90	$5,728	No sources operating in Clark County.
	NonEGU Point	Cement Manufacturing - Wet	Selective Non-Catalytic Reduction	50	$1,335	No sources operating in Clark County.
	NonEGU Point	Cement Manufacturing - Wet or Dry	Low NOx Burner	27	$653	No sources operating in Clark County.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
	NonEGU Point	Cement Manufacturing - Wet or Dry	Mid-Kiln Firing	41	$82	No sources operating in Clark County.
	NonEGU Point	Ceramic Clay Mfg; Drying	Low NOx Burner	50	NOX < 365 tpy: $3,815 NOX > 365 tpy: $3,122	No sources operating in Clark County.
	NonEGU Point	Coal Cleaning-Thrml Dryer; Fluidized Bed	Low NOx Burner	50	NOX < 365 tpy: $1,338 NOX > 365 tpy: $268	No sources operating in Clark County.
30190013	NonEGU Point	Comm./Inst. Incinerators	Selective Non-Catalytic Reduction	45	$1,960	Emissions from this source category are negligible and therefore the control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	Conv Coating of Prod; Acid Cleaning Bath	Low NOx Burner	50	NOX < 365 tpy: $3,815 NOX > 365 tpy: $3,122	No sources operating in Clark County.
	NonEGU Point	External Combustion Boilers, Elec Gen, Coal	Selective Non-Catalytic Reduction	40	$1,642	No sources operating in Clark County.
20100201	NonEGU Point	External Combustion Boilers, Elec Gen, Dis Oil	Selective Non-Catalytic Reduction	50	$5,838	This control measure could result in emissions reductions of 1.4 tpd. This control measure is not cost effective. This control measure is not needed for attainment and cannot advance the moderate area attainment date.
10100601, 10100602	NonEGU Point	External Combustion Boilers, Elec Gen, Nat Gas	Natural Gas Reburn	50	$2,821	Emissions from this source category are negligible and therefore the control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
	NonEGU Point	External Combustion Boilers, Elec Gen, Res Oil and Solid Waste	Selective Non-Catalytic Reduction	50	$3,231	No sources operating in Clark County.
	NonEGU Point	Fbrglass Mfg; Txtle-Type Fbr; Recup Furn	Low NOx Burner	40	$2,931	No sources operating in Clark County.
	NonEGU Point	Fluid Cat Cracking Units; Cracking Unit	Selective Catalytic Reduction	90	$8,269	No sources operating in Clark County.
	NonEGU Point	Fluid Cat Cracking Units; Cracking Unit	Low NOx Burner and Flue Gas Recirculation	55	NOX < 365 tpy: $5,532 NOX > 365 tpy: $4,284	No sources operating in Clark County.
	NonEGU Point	Fuel Fired Equip; Furnaces; Natural Gas	Low NOx Burner	50	$989	No sources operating in Clark County.
	NonEGU Point	Fuel Fired Equip; Process Htrs; Pro Gas	Low NOx Burner and Flue Gas Recirculation	55	NOX < 365 tpy: $5,532 NOX > 365 tpy: $4,284	No sources operating in Clark County.
20100801, 31000203, 20300203	NonEGU Point	Gas Turbines - Natural Gas	Catalytic Combustion	98	NOX < 365 tpy: $1,330 DC < 26 MW: $969 DC > 26 MW: $535	This control measure could achieve 0.42 tpd in emissions reductions. This control measure is not necessary for attainment and cannot advance the attainment date.
20100801,	NonEGU Point	Gas Turbines - Natural Gas	Dry Low NOx Combustion	84	NOX < 365 tpy: $434 NOX > 365 tpy: $188	This control measure could achieve 0.36 tpd in emissions reductions. This control measure is not necessary for attainment and cannot advance the attainment date.
31000203,	NonEGU Point	Gas Turbines - Natural Gas	EMx and Dry Low NOx Combustion	99	NOX > 365 tpy: $2,401	Emissions from this source category are negligible. The control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
20300203	NonEGU Point	Gas Turbines - Natural Gas	EMx	95	NOX > 365 tpy: $2,401	Emissions from this source category are negligible. The control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	Gas Turbines - Natural Gas	EMx and Water Injection	99	NOX > 365 tpy: $3,467	Emissions from this source category are negligible. The control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	Gas Turbines - Natural Gas	Low NOx Burner	84	NOX < 365 tpy: $850 NOX > 365 tpy: $173	Emissions from this source category are negligible. The control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
20100801, 31000203, 20300203	NonEGU Point	Gas Turbines - Natural Gas	SCR + DLN Combustion	94.6	DC > 26 MW: $564 DC < 26 MW: $2,603 DC < 26 MW: $1,431	This control measure could achieve 0.41 tpd in emissions reductions. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
20100801, 31000203, 20300203	NonEGU Point	Gas Turbines - Natural Gas	Selective Catalytic Reduction and Steam Injection	95	DC > 26 MW: $824 DC < 26 MW: $3,716 DC < 26 MW: $1,995	This control measure could achieve 0.41 tpd in emissions reductions. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
20100801, 31000203, 20300203	NonEGU Point	Gas Turbines - Natural Gas	Selective Catalytic Reduction and Water Injection	94.1	DC > 26 MW: $1,547 DC < 26 MW: $4,034 DC < 26 MW: $1,981	This control measure could achieve 0.41 tpd in emissions reductions. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
20100801, 31000203, 20300203	NonEGU Point	Gas Turbines - Natural Gas	Steam Injection	80	DC > 26 MW: $723 DC < 26 MW: $2,443 DC < 26 MW: $1,186	This control measure could achieve 0.35 tpd in emissions reductions. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
20100801, 31000203, 2030023	NonEGU Point	Gas Turbines - Natural Gas	Water Injection	72	DC > 34.4 MW: $1,055 DC < 34.4 MW: $2,588 DC < 34.4 MW: $1,446	This control measure could achieve 0.32 tpd in emissions reductions. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	Glass Manufacturing - Container	Low NOx Burner	40	$1,436	No sources operating in Clark County.
	NonEGU Point	Glass Manufacturing - Container	Selective Catalytic Reduction	75	$2,135	No sources operating in Clark County.
	NonEGU Point	Glass Manufacturing - Container or Pressed	Cullet Preheat	5	$6,812	No sources operating in Clark County.
	NonEGU Point	Glass Manufacturing - Flat	Catalytic Ceramic Filter	80	$11,414	No sources operating in Clark County.
	NonEGU Point	Glass Manufacturing - Flat	Low NOx Burner	40	$573	No sources operating in Clark County.
	NonEGU Point	Glass Manufacturing - Flat	Selective Catalytic Reduction	75	$1,055	No sources operating in Clark County.
	NonEGU Point	Glass Manufacturing - General	Electric Boost	30	$9,673	No sources operating in Clark County.
	NonEGU Point	Glass Manufacturing - General	Oxygen Enriched Air Staging	65	$797	No sources operating in Clark County.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
	NonEGU Point	Glass Manufacturing - Pressed	Low NOx Burner	40	$2,601	No sources operating in Clark County.
	NonEGU Point	Glass Manufacturing - Pressed	Selective Catalytic Reduction	75	$4,388	No sources operating in Clark County.
2103007000, 2102007000	NonEGU Point	IC Engines - Gas/ Diesel/ LPG	Ignition Retard	25	NOX < 365 tpy: $1,335 NOX > 365 tpy: $850	Some of these engines may already be meeting EPA emissions control requirements. If all emissions from the SCC are uncontrolled and meet the source category description, then maximum emissions reductions of <0.03 tpd could result from implementing this control. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
20200102	NonEGU Point	IC Engines - Gas/ Diesel/ LPG	Ignition Retard	25	NOX < 365 tpy: $1,335 NOX > 365 tpy: $850	This control measure could result in 0.18 tpy emissions reductions for units emitting above 0.003 tpd. This measure is not cost effective. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
20100102, 20300101	NonEGU Point	ICE - Diesel	Selective Catalytic Reduction	90	NOX < 365 tpy: $11,747	This control measure is not cost effective.
	NonEGU Point	ICI Boilers - Coal	Selective Catalytic Reduction	90	$8,194	No sources operating in Clark County.
	NonEGU Point	ICI Boilers - Coal	Selective Non-Catalytic Reduction	35	$8,410	No sources operating in Clark County.
	NonEGU Point	ICI Boilers - Coal/Wall	Low NOx Burner	47.5	25tpy < NOX < 100 tpy: $8,057 100tpy < NOX < 250 tpy: $2,694 NOX > 250 tpy: $909	No sources operating in Clark County.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
	NonEGU Point	ICI Boilers - Coal/Wall	Ultra Low NOx Burner and Selective Catalytic Reduction	91	25tpy < NOX < 100 tpy: $17,697 100tpy < NOX < 250 tpy: $6,312 NOX > 250 tpy: $2,343	No sources operating in Clark County.
	NonEGU Point	ICI Boilers - Coal/Wall	Ultra Low NOx Burner and Selective Non-Catalytic Reduction	69.5	25tpy < NOX < 100 tpy: $12,875 100tpy < NOX < 250 tpy: $4,877 NOX > 250 tpy: $2,143	No sources operating in Clark County.
10300602, 20200202	NonEGU Point	ICI Boilers - Gas	Flue Gas Recirculation	40	25tpy < NOX < 50 tpy: $23,290 50tpy < NOX < 100 tpy: $12,423 NOX > 100 tpy: $6,602	There are no sources emitting above 25 tpy in the emissions inventory. Therefore, this control measure is not cost effective. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
10300602, 20200202	NonEGU Point	ICI Boilers - Gas	Low NOx Burner and Flue Gas Recirculation	61	25tpy < NOX < 50 tpy: $25,768 50tpy < NOX < 100 tpy: $13,798 NOX > 100 tpy: $7,338	There are no sources emitting above 25 tpy in the emissions inventory. Therefore, this control measure is not cost effective. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
10300602, 20200202	NonEGU Point	ICI Boilers - Gas	Ultra Low NOx Burner	75	25tpy < NOX < 50 tpy: $8,605 50tpy < NOX < 100 tpy: $4,603 NOX > 100 tpy: $2,451	There are no sources emitting above 25 tpy in the emissions inventory. Therefore, this control measure is not cost effective. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
10300602, 20200202	NonEGU Point	ICI Boilers - Gas	Ultra Low NOx Burner and Selective Catalytic Reduction	91	25tpy < NOX < 50 tpy: $31,198 50tpy < NOX < 100 tpy: $17,166 NOX > 100 tpy: $9,300	There are no sources emitting above 25 tpy in the emissions inventory. Therefore, this control measure is not cost effective. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
10100602, 10201402, 5010799, 10200603	NonEGU Point	ICI Boilers - Gas	Low NOx Burner and Selective Non-Catalytic Reduction	69.5	25tpy < NOX < 50 tpy: $21,826 50tpy < NOX < 100 tpy: $12,047 NOX > 100 tpy: $6,740	The only stationary source in the source category emitting above 25tpy will be regulated by major source NOx RACT. No additional emissions control is cost effective.
10100602, 10201402, 5010799, 10200603	NonEGU Point	ICI Boilers - Gas	Selective Catalytic Reduction	90	$11,441	This control is not cost effective. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
10300602	NonEGU Point	ICI Boilers - Gas	Selective Non-Catalytic Reduction	35	$11,071	The control measure is not cost effective. If the control measure is applied to sources in the county emitting greater than 10 tpy, then 0.03 tpd of emissions reductions could be achieved. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	ICI Boilers - Oil	Flue Gas Recirculation	40	NOX > 25 tpy: $13,000	No sources operating in Clark County.
2102004001	NonEGU Point	ICI Boilers - Oil	Low NOx Burner and Flue Gas Recirculation	61	NOX > 25 tpy: $14,054	Emissions in the inventory are from nonpoint sources. Control of emissions are not cost effective.
	NonEGU Point	ICI Boilers - Oil	Low NOx Burner	47.5	NOX > 25 tpy: $1,499	No sources operating in Clark County.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
20300101	NonEGU Point	ICI Boilers - Oil	Ultra Low NOx Burner and Selective Catalytic Reduction	91	NOX > 25 tpy: $4,076	If this control technology is applied to source emitting above 25 tpy, then it could result in 0.08 tpd of emissions reductions. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	ICI Boilers - Oil	Low NOx Burner and Selective Non-Catalytic Reduction	69.5	NOX > 25 tpy: $3,361	If this control technology is applied to source emitting above 25 tpy, then it could result in 0.17 tpd of emissions reductions. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
10300502	NonEGU Point	ICI Boilers - Oil	Selective Catalytic Reduction	90	$8,914	Emissions from this source category are negligible. The control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	ICI Boilers - Oil	Selective Non-Catalytic Reduction	35	$9,537	
	NonPoint	Industrial Coal Combustion	RACT to 25 tpy (Low NOx Burner)	21	NOX > 25 tpy: $2,341	No sources operating in Clark County.
	NonPoint	Industrial Coal Combustion	RACT to 50 tpy (Low NOx Burner)	21	NOX > 50 tpy: $2,341	No sources operating in Clark County.
	NonEGU Point	Industrial Incinerators	Selective Catalytic Reduction	90	$4,495	Emissions from this source category are negligible and therefore the control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	Industrial Incinerators, Municipal Waste Combustors	Selective Non-Catalytic Reduction	45	$1,960	No sources operating in Clark County.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
	NonPoint	Industrial NG Combustion	RACT to 25 tpy (Low NOx Burner)	31	NOX > 25 tpy: $1,335	Sources already considered in major source NOx RACT analyses.
	NonPoint	Industrial NG Combustion	RACT to 50 tpy (Low NOx Burner)	31	NOX > 50 tpy: $1,335	Sources already considered in major source NOx RACT analyses.
	NonEGU Point	Industrial NG ICE, 4cycle (rich)	Non-Selective Catalytic Reduction	90	$610	No sources operating in Clark County.
10201402 10200602 50100799 10200603	NonEGU Point	Industrial NG ICE, SCCs with technology not specified	Non-Selective Catalytic Reduction or Adjust Air Fuel Ratio and Ignition Retard	39	NOX < 365 tpy: $2,219 NOX > 365 tpy: $772	If all emissions from the referenced SCCs are uncontrolled and meet the source category description, then maximum emissions reductions of <0.02 tpd could result from implementing this control. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	Industrial NG ICE, SCCs with technology not specified	Non-Selective Catalytic Reduction or Layered Combustion	95.95	$4,924	No sources operating in Clark County.
	NonEGU Point	Industrial NG ICE, SCCs with technology not specified	Non-Selective Catalytic Reduction or Low Emission Combustion	87.45	$667	No sources operating in Clark County.
	NonPoint	Industrial Oil Combustion	RACT to 25 tpy (Low NOx Burner)	36	NOX > 25 tpy: $2,046	Sources already considered in major source NOx RACT analyses.
	NonPoint	Industrial Oil Combustion	RACT to 50 tpy (Low NOx Burner)	36	NOX > 50 tpy: $2,046	Sources already considered in major source NOx RACT analyses.
	NonEGU Point	In-Proc;Process Gas;Coke Oven/Blast Furn	Low NOx Burner and Flue Gas Recirculation	55	NOX < 365 tpy: $5,532 NOX > 365 tpy: $4,284	No sources operating in Clark County.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
	NonEGU Point	In-Process Fuel Use - Gas	Selective Catalytic Reduction	90	$7,161	No sources operating in Clark County.
	NonEGU Point	In-Process Fuel Use; Natural Gas; Gen	Low NOx Burner	50	NOX < 365 tpy: $3,815 NOX > 365 tpy: $3,122	No sources operating in Clark County.
	NonEGU Point	In-Process Fuel Use; Residual Oil; Gen	Selective Catalytic Reduction	90	$6,446	No sources operating in Clark County.
	NonEGU Point	In-Process Fuel Use; Residual Oil; Gen	Low NOx Burner	37	NOX < 365 tpy: $4,370 NOX > 365 tpy: $1,231	No sources operating in Clark County.
	NonEGU Point	In-Process Fuel Use;Bituminous Coal; Gen	Selective Catalytic Reduction	90	$4,377	No sources operating in Clark County.
	NonEGU Point	In-Process Fuel Use;Bituminous Coal; Gen	Selective Non-Catalytic Reduction	40	NOX < 365 tpy: $2,185 NOX > 365 tpy: $1,630	No sources operating in Clark County.
30501604	NonEGU Point	In-Process; Bituminous Coal; Cement and Lime Kilns	Selective Catalytic Reduction	90	$3,064	Implementation of this control measure on lime kilns emitting greater than 100 tpy could result in 2.16 tpd of emissions reductions if the lime kilns are currently uncontrolled. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	In-Process; Bituminous Coal; Cement Kiln	Selective Non-Catalytic Reduction	50	$1,335	No sources operating in Clark County.
	NonEGU Point	In-Process; Bituminous Coal; Lime Kiln	Selective Non-Catalytic Reduction	50	$1,335	No sources operating in Clark County.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
	NonEGU Point	In-Process; Process Gas; Coke Oven Gas	Selective Catalytic Reduction	90	$9,212	No sources operating in Clark County.
	NonEGU Point	In-Process; Process Gas; Coke Oven Gas	Low NOx Burner	50	NOX < 365 tpy: $3,815 NOX > 365 tpy: $3,122	No sources operating in Clark County.
	NonEGU Point	Internal Combustion Engines - Gas	Adjust Air to Fuel Ratio	20	NOX < 365 tpy: $2,723 NOX > 365 tpy: $659	No sources operating in Clark County.
	NonEGU Point	Internal Combustion Engines - Gas	Adjust Air to Fuel Ratio and Ignition Retard	30	NOX < 365 tpy: $2,497 NOX > 365 tpy: $798	No sources operating in Clark County.
2103006000	NonEGU Point	Internal Combustion Engines - Gas	Ignition Retard	20	NOX < 365 tpy: $1,769 NOX > 365 tpy: $954	Some of these engines may already be meeting EPA emissions control requirements. If all emissions from the SCC are uncontrolled and meet the source category description, then maximum emissions reductions of <0.17 tpd could result from implementing this control. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
2102004002	NonEGU Point	Internal Combustion Engines - Oil	Ignition Retard	25	NOX < 365 tpy: $1,335 NOX > 365 tpy: $850	Some of these engines may already be meeting EPA engine standards. If all emissions from the SCC are uncontrolled and meet the source category description, then maximum emissions reductions of <0.21 tpd could result from implementing this control. This measure is not necessary for attainment and cannot advance the moderate area attainment date.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
10300502	NonEGU Point	Internal Combustion Engines - Oil	Selective Catalytic Reduction	80	NOX < 365 tpy: $4,058 NOX > 365 tpy: $1,595	Emissions from this source category are negligible and therefore the control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	Iron & Steel - In-Process Combustion - Bituminous Coal	Selective Catalytic Reduction	90	$4,377	No sources operating in Clark County.
	NonEGU Point	Iron & Steel - In-Process Combustion - Natural Gas and Process Gas - Coke Oven Gas	Selective Catalytic Reduction	90	$7,161	No sources operating in Clark County.
	NonEGU Point	Iron & Steel - In-Process Combustion - Natural Gas or Coke Oven Process Gas	Low NOx Burner	50	NOX < 365 tpy: $3,815 NOX > 365 tpy: $3,122	No sources operating in Clark County.
	NonEGU Point	Iron & Steel - In-Process Combustion - Process Gas -Coke Oven/ Blast Furnace	Low NOx Burner and Flue Gas Recirculation	55	NOX < 365 tpy: $5,532 NOX > 365 tpy: $4,284	No sources operating in Clark County.
	NonEGU Point	Iron & Steel - In-Process Combustion - Residual Oil	Selective Catalytic Reduction	90	$6,446	No sources operating in Clark County.
	NonEGU Point	Iron & Steel Mills - Annealing	Low NOx Burner and Selective Non-Catalytic Reduction	80	$2,983	No sources operating in Clark County.
	NonEGU Point	Iron & Steel Mills - Annealing	Low NOx Burner and Selective	90	$7,076	No sources operating in Clark County.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
			Catalytic Reduction			
	NonEGU Point	Iron & Steel Mills - Annealing	Low NOx Burner	50	$989	No sources operating in Clark County.
	NonEGU Point	Iron & Steel Mills - Annealing	Selective Non-Catalytic Reduction	60	$2,844	No sources operating in Clark County.
	NonEGU Point	Iron & Steel Mills - Annealing2	Selective Catalytic Reduction	90	$7,618	No sources operating in Clark County.
	NonEGU Point	Iron & Steel Mills - Galvanizing	Low NOx Burner and Flue Gas Recirculation	60	$1,006	No sources operating in Clark County.
	NonEGU Point	Iron & Steel Mills - Galvanizing	Low NOx Burner	50	$850	No sources operating in Clark County.
	NonEGU Point	Iron & Steel Mills - Reheating	Low Excess Air	13	$2,289	No sources operating in Clark County.
	NonEGU Point	Iron & Steel Mills - Reheating	Low NOx Burner	66	$520	No sources operating in Clark County.
	NonEGU Point	Iron and Steel Production - Annealing or Soaking Pits	Low NOx Burner and Flue Gas Recirculation	60	$1,301	No sources operating in Clark County.
	NonEGU Point	Iron and Steel Production; Blast Heating or Reheating	Low NOx Burner and Flue Gas Recirculation	77	$659	No sources operating in Clark County.
	NonEGU Point	Lean Burn ICE - NG	Air to Fuel Ratio Controller	20	NOX < 365 tpy: $1,121	No sources operating in Clark County.
	NonEGU Point	Lean Burn ICE - NG	Layered Combustion	97	NOX < 365 tpy: $43,657 NOX > 365 tpy: $1,723	No sources operating in Clark County.
	NonEGU Point	Lean Burn ICE - NG	Layered Combustion	97	$5,695	No sources operating in Clark County.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
	NonEGU Point	Lean Burn ICE - NG	Low Emission Combustion	80	NOX < 365 tpy: $1,384	No sources operating in Clark County.
	NonEGU Point	Lean Burn ICE - NG	Selective Catalytic Reduction	90	$4,013	No sources operating in Clark County.
30501604	NonEGU Point	Lime Kilns	Low NOx Burner	30	$971	This control measure could result in 0.61 tpd of emissions reductions. This measure is not necessary for attainment and cannot advance the attainment date.
	NonEGU Point	Medical Waste Incinerators	Selective Non-Catalytic Reduction	45	$7,821	No sources operating in Clark County.
	NonEGU Point	Nitric Acid Manufacturing	Extended Absorption	95	$832	No sources operating in Clark County.
	NonEGU Point	Nitric Acid Manufacturing	Non-Selective Catalytic Reduction	98	$954	No sources operating in Clark County.
	NonEGU Point	Nitric Acid Manufacturing2	Selective Catalytic Reduction	90	$1,174	No sources operating in Clark County.
	NonEGU Point	Petroleum Refinery Gas-Fired Process Heaters	Excess O3 Control	37	NOX > 25 tpy: $70	No sources operating in Clark County.
	NonEGU Point	Petroleum Refinery Gas-Fired Process Heaters	SCR-95%	84	NOX > 25 tpy: $12,352	No sources operating in Clark County.
	NonEGU Point	Petroleum Refinery Gas-Fired Process Heaters	Selective Catalytic Reduction	71	NOX > 25 tpy: $10,798	No sources operating in Clark County.
	NonEGU Point	Petroleum Refinery Gas-Fired Process Heaters	Ultra-Low NOx Burner	53	NOX > 25 tpy: $1,803	No sources operating in Clark County.
	NonEGU Point	Plastics Prod-Specific; (ABS) Resin	Low NOx Burner and Flue Gas Recirculation	55	NOX < 365 tpy: $5,532 NOX > 365 tpy: $4,284	Emissions from this source category are negligible and therefore the control measure is not cost effective. This control measure is not necessary for attainment and cannot advance the moderate area nonattainment date.
	NonEGU Point	Pri Cop Smel; Reverb Smelt Furn	Low NOx Burner and Flue	60	$1,301	No sources operating in Clark County.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
			Gas Recirculation			
2102004002 20100102	NonEGU Point	Reciprocating IC Engines - Oil	Ignition Retard	25	$1,335	This control measure could result in 0.4 tpd emission reduction from nonpoint sources; emissions from point sources are trivial. This control measure is not necessary for attainment and cannot advance the moderate area attainment date.
30500208	NonEGU Point	Sand/Gravel; Dryer	Low NOx Burner and Flue Gas Recirculation	55	NOX < 365 tpy: $5,532 NOX > 365 tpy: $4,284	Emissions from this source category are negligible and therefore the control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	Sec Alum Prod; Smelting Furn/Reverb	Low NOx Burner	50	$989	No sources operating in Clark County.
	NonEGU Point	Solid Waste Disp;Gov;Other Incin;Sludge	Selective Non-Catalytic Reduction	45	$1,960	No sources operating in Clark County.
30301201 10500206	NonEGU Point	Space Heaters - Distillate Oil	Low NOx Burner and Flue Gas Recirculation	60	NOX < 365 tpy: $4,318 NOX > 365 tpy: $1,318	Emissions from this source category are negligible and therefore the control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
30301201 10500206	NonEGU Point	Space Heaters - Distillate Oil	Low NOx Burner	50	NOX < 365 tpy: $2,046 NOX > 365 tpy: $3,590	Emissions from this source category are negligible and therefore the control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
30301201 10500206	NonEGU Point	Space Heaters - Distillate Oil	Selective Catalytic Reduction	80	NOX < 365 tpy: $4,821 NOX > 365 tpy: $2,619	Emissions from this source category are negligible and therefore the control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
30301201 10500206	NonEGU Point	Space Heaters - Distillate Oil	Selective Non-Catalytic Reduction	50	NOX < 365 tpy: $8,047 NOX > 365 tpy: $3,278	Emissions from this source category are negligible and therefore the control measure is not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	Space Heaters - Natural Gas	Low NOx Burner and Flue Gas Recirculation	60	NOX < 365 tpy: $4,440 NOX > 365 tpy: $1,023	No sources operating in Clark County.
	NonEGU Point	Space Heaters - Natural Gas	Low NOx Burner	50	NOX < 365 tpy: $1,422 NOX > 365 tpy: $1,127	No sources operating in Clark County.
	NonEGU Point	Space Heaters - Natural Gas	Selective Catalytic Reduction	80	NOX < 365 tpy: $4,960 NOX > 365 tpy: $2,098	No sources operating in Clark County.
	NonEGU Point	Space Heaters - Natural Gas	Selective Non-Catalytic Reduction	50	NOX < 365 tpy: $6,711 NOX > 365 tpy: $2,723	No sources operating in Clark County.
30504033	NonEGU Point	Starch Mfg; Combined Operations	Low NOx Burner and Flue Gas Recirculation	55	NOX < 365 tpy: $5,532 NOX > 365 tpy: $4,284	Implementation of this control measure could result in 0.19 tpd of emissions reductions. This control measure is likely not cost effective. This measure is not necessary for attainment and cannot advance the moderate area attainment date.
	NonEGU Point	Steel Foundries; Heat Treating Furn	Low NOx Burner	50	$989	No sources operating in Clark County.
40201001	NonEGU Point	Surf Coat Oper;Coating Oven Htr;Nat Gas	Low NOx Burner	50	NOX < 365 tpy: $3,815 NOX > 365 tpy: $3,122	This control measure could result in 0.005 tpd emissions reductions. This control measure is not necessary for attainment and cannot advance the attainment date.
	NonEGU Point	Taconite Iron Ore Processing -	Selective Catalytic Reduction	90	$7,618	No sources operating in Clark County.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
		Induration - Coal or Gas				
	EGU	Utility Boiler - Coal/Tangential	Low NOx Coal-and-Air Nozzles with cross-Coupled Overfire Air	42	DC > 25 MW: $440	No sources operating in Clark County.
	EGU	Utility Boiler - Coal/Tangential	Low NOx Coal-and-Air Nozzles with separated Overfire Air	47	DC > 25 MW: $549	No sources operating in Clark County.
	EGU	Utility Boiler - Coal/Tangential	Low NOx Coal-and-Air Nozzles with Cross-Coupled and Separated Overfire Air	62	DC > 25 MW: $490	No sources operating in Clark County.
	EGU	Utility Boiler - Coal/Tangential	Selective Catalytic Reduction	90	25 MW < DC < 99 MW: $2,674 100 MW < DC < 299 MW: $2,269 300 MW < DC < 499 MW: $2,146 500 MW < DC < 699 MW: $2,083 DC > 700 MW: $2,019	No sources operating in Clark County.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness (2018$/ton reduced)	RACM Conclusion
	EGU	Utility Boiler - Coal/Tangential	Selective Non-Catalytic Reduction	25	25 MW < DC < 99 MW: $3,470 100 MW < DC < 299 MW: $2,821 300 MW < DC < 499 MW: $2,644 500 MW < DC < 699 MW: $2,546 DC > 700 MW: $2,447	No sources operating in Clark County.
	EGU	Utility Boiler - Coal/Wall	Low NOx Burner and Over Fire Air	72	DC > 25 MW: $698	No sources operating in Clark County.
	EGU	Utility Boiler - Coal/Wall	Low NOx Burner	57	DC > 25 MW: $646	No sources operating in Clark County.
	EGU	Utility Boiler - Oil-Gas/Tangential	Selective Catalytic Reduction	80	DC > 25 MW: $1,621	No sources operating in Clark County.
	EGU	Utility Boiler - Oil-Gas/Wall	Selective Catalytic Reduction	80	DC > 25 MW: $1,621	No sources operating in Clark County.

Table 5. Analysis of Potential Point and Nonpoint VOC Control Measures for HA 212

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness ($/ton reduced)	RACM Conclusion
	NonEGU Point	Flexible Package Printing	Add-on controls, work practices, and material reformulation/substitution	67	$3,433	This control measure will be implemented by a CTG RACT rule.
	NonEGU Point	Generic NonEGU	Carbon Adsorber	99	$1,349	This recommendation is not associated with any industrial category.
	NonEGU Point	Generic NonEGU	Catalytic Oxidizer	99	$2,335	This recommendation is not associated with any industrial category.
	NonEGU Point	Miscellaneous Metal and Plastic Parts Coatings	Coating Reformulation	35	$2,155	This control measure will be implemented by a CTG RACT Rule.
	NonEGU Point	Flat Wood Paneling Coatings	Low-VOC materials coatings and Add-On Controls	90	$3,188	No sources operating in HA 212
	NonEGU Point	Paper Film and Foil Coatings	Low-VOC coating materials and/or add-on controls	90	$1,471	Sections 12.1.3.6(b) & (c) and Section 12.1.4.1(f) meet the CTG RACT requirement for the only stationary source in this category operating within HA 212.
	NonEGU Point	Flat Wood Paneling Coatings	Low-VOC materials coatings	60	$2,329	No sources operating in HA 212
	NonEGU Point	Large Appliance Surface Coating	Low-VOC coating materials	30	$613	No sources operating in HA 212
	NonEGU Point	Metal Furniture Coatings	Low-VOC coating materials	35	$245	No sources operating in HA 212
	NonEGU Point	Miscellaneous Industrial Adhesives	Low VOC Adhesives and Improved Application Methods	64	$322	This control measure will be implemented by a CTG RACT rule.
	NonEGU Point	Fabric Printing/ Coating and Dyeing	Permanent Total Enclosure (PTE)	97	$1,992	No sources operating in HA 212

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness ($/ton reduced)	RACM Conclusion
	NonEGU Point	Metal Can Surface Coating	Permanent Total Enclosure (PTE)	95	$11,538	This measure would not be cost effective and the measure is not necessary for attainment and will not advance the moderate area attainment date.
	NonEGU Point	Metal Furniture Surface Coating	Permanent Total Enclosure (PTE)	95	$28,339	No sources operating in HA 212
	NonEGU Point	Paper and Other Web Coating	Permanent Total Enclosure (PTE)	95	$2,204	No sources operating in HA 212
	NonEGU Point	Product and Package Rotogravure Printing	Permanent Total Enclosure (PTE)	96	$20,459	This measure would not be cost effective and the measure is not necessary for attainment and will not advance the moderate area attainment date.
	NonEGU Point	Generic NonEGU	Regenerative Thermal Oxidizer	99	$2,581	This recommendation is not associated with any industrial category.
	NonEGU Point	Fiberglass Boat Manufacturing	Solvent substitution, non-atomized resin application methods	35	$5,149	No sources operating in HA 212
	NonEGU Point	Miscellaneous Industrial Adhesives	Solvent Substitution	64	$325	This control measure will be implemented by a CTG RACT Rule
	NonEGU Point	Generic NonEGU	Vapor Recovery Unit	97	$25,356	This measure would not be cost effective and the measure is not necessary for attainment and will not advance the moderate area attainment date.
250101101325010110122501012014250101101125010120132501012012 2501012011	Non EGU Point	Portable Fuel Container	OTC Phase I Model Rule	65	$581/ton	This control measure might reduce VOC emissions by 1.04 tpd within 5 years or 0.201 tpd/year assuming 5 year implementation schedule and 100% rule effectiveness (OTC. 2001). This control measure is not needed for attainment and will not advance the moderate area attainment date.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness ($/ton reduced)	RACM Conclusion
2501011013 2501011012 2501012014 2501011011 2501012013 2501012012 2501012011	Non EGU Point	Portable Fuel Container	OTC Phase II Model Rule/CARB Rule	58	$800-1400/ton	This control measure might reduce emissions by 0.0.61 tpd (in addition to phase I) within 5 years or 0.12 tpd/year assuming 100% rule effectiveness (OTC, 2007). This control measure is not needed for attainment and will not advance the moderate area attainment date
2461800000	Nonpoint	Agriculture - Pesticides	CARB Rule	45-70	<$14, 926	Assuming 57.5% emissions controls, this control measure could result in 0.29 tpd of emissions reductions. This measure likely is not cost effective. This control measure is not needed for attainment and will not advance the moderate area attainment date.
2302002200	Nonpoint	Commercial Cooking	Catalytic oxidizer	86%	$2,359	This measure could result in 0.16 tpd of emissions reductions and would have PM10 emission reduction co-benefits. This control measure is not necessary for attainment and will not advance the moderate area attainment date.
2610000500	Nonpoint	Construction Debris	Prohibition	100%	unknown	Section 42 already prohibits open burning of construction debris.
2680003000	Nonpoint	Composting	Cover; BMP	16%	unknown	This control measure could result in 0.12 tpd of emissions reductions. The economic feasibility of this control measure is unknown. This control measure is not necessary for attainment and will not advance the moderate area attainment date.
	Nonpoint	Adhesives and Coatings	Low VOC Coatings		unknown	This control measure might reduce VOC emissions by 0.421 tpd. The economic feasibility of this control measure is unknown. This control measure is not necessary for attainment and will not advance the moderate area attainment date.

SCC	Sector	Source Category	Emission Reduction Measure	Control Efficiency (%)	Cost Effectiveness ($/ton reduced)	RACM Conclusion
	Nonpoint	Emulsified Asphalt	Reduce VOC Content to 3% by volume		Unknown	This control measure might reduce VOC emissions by 2.29 tpd within HA 21 and 2.45 tpd if extended to the entire County assuming an 80% rule effectiveness and average material density of 7.51 lb VOC/gal before control. This measure is not needed for attainment and will not advance the moderate area attainment date.

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