Second Maintenance Plan for the 1997 8-hour Ozone NAAQS

Clark County, Nevada

December 2021

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EXECUTIVE SUMMARY

This *Second Maintenance Plan for the 1997 8-hour Ozone NAAQS* is submitted by the Clark County Department of Environment and Sustainability to the U.S. Environmental Protection Agency (EPA) to fulfill its requirements related to maintenance plans for the 1997 8-hour ozone National Ambient Air Quality Standard (NAAQS). The plan summarizes Clark County's continued maintenance of the 1997 8-hour ozone standard and presents a plan to assure continued attainment over the next ten years.

This plan provides an ozone attainment demonstration that makes use of the most recently adopted planning variables (e.g., vehicle miles traveled projections and population forecasts) approved by the designated Metropolitan Planning Organization for the Las Vegas urban area, (i.e., the Regional Transportation Commission of Southern Nevada). The plan also provides, among other things, revised emission inventories and updated motor vehicle emissions budgets (MVEBs).

After EPA approval, the plan will become a federally enforceable plan that identifies how Clark County will maintain the 1997 ozone NAAQS through 2033. Once approved, the MVEBs contained in the plan will become the projected budgets that the Regional Transportation Commission of Southern Nevada will use for transportation conformity determinations in future regional transportation plans.

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ACRONYMS AND ABBREVIATIONS

AQR	Clark County Air Quality Regulations
BCC	Clark County Board of County Commissioners
CAA	Federal Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
DAF	Department of Air Force
DAQ	Clark County Department of Environment and Sustainability, Division of Air Quality
DAQEM	Clark County Department of Air Quality & Environmental Management
DES	Clark County Department of Environment and Sustainability
DRI	Desert Research Institute
EPA	U.S. Environmental Protection Agency
EQM	Environmental Quality Management, Inc
ERC	Emission Reduction Credit
HA	Hydrographic Area
HPMS	Highway Performance Monitoring System
I/M	Nevada Vehicle Inspection and Maintenance Program
MVEB	Motor Vehicle Emission Budget
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NEI	National Emission Inventory
NDEP	Nevada Division of Environmental Protection
NOx	nitrogen oxides
NRS	Nevada Revised Statues
PM	particulate matter
ppm	parts per million
QAPP	Quality Assurance Project Plan
RTC	Regional Transportation Commission of Southern Nevada
SIP	state implementation plan
SLAMS	State and Local Air Monitoring System
SNSA	Southern Nevada Supplemental Airport
TDM	Transportation Demand Model
tpd	tons per day
TSD	Technical Support Document
VMT	vehicle miles traveled
VOCs	volatile organic compounds

1.0 PLAN OVERVIEW

1.1 INTRODUCTION

The Clean Air Act ("CAA") sets forth the proposition that air pollution prevention and air pollution control are "the primary responsibility of States and local governments" (42 U.S.C. §7401(a)(3)). In recognition of this responsibility, the CAA established a framework of cooperative federalism wherein EPA sets forth minimum requirements for state air quality programs. *See* CAA Section 110 Implementation Plans (42 U.S.C §7410). Under EPA's implementing regulations at 40 C.F.R Part 51, each state must submit plans, referred to as "state implementation plans" or "SIPs" to carry out air pollution control measures required by the CAA. Part of these SIP requirements is the development of maintenance plans for areas previously designated nonattainment with a National Ambient Air Quality Standard ("NAAQS").

In Nevada, under the Nevada Revised Statutes ("NRS") for Air Pollution, each county in the State with a population equal to or greater than 100,000 people must establish a board of county commissioners to establish and implement an air pollution control program. (NRS §445B.500). In 2001, the Clark County Board of County Commissioners ("BCC") established the Department of Air Quality") to carry out the mandated program of air pollution control. The State of Nevada then delegated its responsibilities for meeting CAA requirements, including the requirement to develop and submit maintenance plans, to the BCC. EPA subsequently approved this delegation of power into the Nevada SIP (40 CFR §52.1470). Between 2001 and 2020, the department also functioned under the names "Department of Air Quality and Environmental Management" and "Department of Air Quality Management."

In 2020, the BCC renamed the Department of Air Quality to the Department of Environment and Sustainability and divided the department into three divisions: Air Quality, Desert Conservation Program and Office of Sustainability. The Division of Air Quality ("DAQ") is now responsible for administering the air pollution control program for Clark County under the provisions of the Clark County Air Quality Regulations and the EPA-approved SIP (Clark County Air Quality Regulations Section 00 through Section 94 as adopted in 40 CFR Part 52, Subpart DD). The mission of DAQ is to develop and implement high-quality, effective local programs to fulfill air quality regulatory requirements and address community concerns, thereby protecting the region's quality of life while facilitating orderly growth.

In furtherance of this mission, the DAQ prepared this second maintenance plan to fulfill the State Implementation Plan ("SIP") obligations for Clark County, Nevada. This plan projects that the areas in Clark County previously designated nonattainment for the 1997 8-hour ozone NAAQS (now the "maintenance area") will continue to attain the NAAQS for the entirety of the second maintenance period (2022 through 2033).

To demonstrate continued attainment, DAQ used the Emission Inventory Method (Calcagni 1992). The DAQ previously used the Emissions Inventory Method in its first maintenance plan for the NAAQS- *Ozone Redesignation Request and Maintenance Plan* (hereafter referred to as "the 2011 Maintenance Plan") (DAQEM 2011). EPA approved this plan in 2013 (78 FR 1149). DAQ also used the Emissions Inventory Method for a revision to the Motor Vehicle Emissions Budget

(MVEB) estimates in 2018 (DAQ 2018). EPA conditionally approved this MVEB in 2019 (84 FR 44699).

Using the Emissions Inventory Method, DAQ used the 2017 National Emissions Inventory (NEI) for volatile organic compounds ("VOCs") and nitrogen oxides ("NO_x") as the base year inventory. Then DAQ adjusted those emissions to project future emissions for 2023 and 2033. The adjustments reflect the effect of federal, state, and local rules on VOC and NO_x emissions already adopted or implemented and potential growth in sector emissions during the maintenance period. After making these adjustments, the DAQ projections demonstrate that future annual summer weekday emissions will remain below the attainment year inventory; this demonstrates continued attainment of the 1997 8-hour ozone NAAQS.

The following provides an overview of ozone health effects and the history of ozone nonattainment in Clark County. Sections 2 through 5 of this document contain the recommended elements of a maintenance plan, including a maintenance demonstration, commitment to operate a monitor network, a method for continued verification of attainment, and a contingency measures plan if ambient ozone concentrations approach or exceed the level of the 1997 8-hour ozone NAAQS.

1.2 CHARACTERISTICS AND HEALTH EFFECTS OF OZONE

Ozone is a gas composed of three oxygen atoms that occurs both in Earth's upper atmosphere (stratosphere) and at ground level (troposphere). Ozone in the stratosphere, which extends upward from 6 to 30 miles, occurs naturally, and protects life from harmful ultraviolet rays. In the troposphere, however, ozone poses a significant health risk, especially for children, the elderly, and people with chronic illnesses. It may also damage crops, trees, and other vegetation.

Ground-level ozone is not usually emitted directly into the air but is instead formed through chemical reactions between NOx and VOCs in the presence of sunlight. NOx and VOCs are known as ozone precursor pollutants because of their potential to form ozone through chemical reactions. Ozone and its precursor pollutants can travel hundreds of miles from their original sources through wind currents. This type of pollution is known as "transport" pollution.

Ozone can irritate lung airways and cause an inflammation that resembles sunburn. Symptoms include wheezing, coughing, pain when taking a deep breath, and difficulty breathing during exercise or outdoor activities. Children and those with respiratory problems are particularly susceptible, but ozone can affect even healthy people who are active outdoors. Repeated exposure to ozone pollution over many months may cause permanent lung damage. Even when concentrations are low, ozone pollution may aggravate asthma, reduce lung capacity, and increase susceptibility to respiratory illnesses like pneumonia and bronchitis.

Ground-level ozone may also affect plants and ecosystems. It interferes with the ability of plants to produce and store food, which makes them more susceptible to disease, insects, harsh weather, and other pollutants. This in turn can impact crop and forest yields. In addition, ozone can damage the leaves of trees and other plants.

The United States Environmental Protection Agency ("EPA") classifies sources of NOx and VOCs emissions by sectors (also sometimes called source categories) in the national emissions inventory that include:

Point Sources: Larger emissions sources located at fixed geographic locations such as power plants and industrial manufacturers.

Nonpoint Sources (area sources): Emissions sources that individually are too small to report as point sources. For example, VOC sources include gas stations, dry cleaners, print shops, and consumer products. NOx sources include natural gas-fired sources such as water heaters and agricultural fires.

On-road sources (mobile sources): Vehicles traveling on paved roads that use gasoline, diesel, and other fuels, e.g., cars, trucks, buses, and motorcycles.

Nonroad sources (mobile sources): Off-road mobile sources not traveling on paved roads that use gasoline, diesel and other fuels, e.g., construction equipment and agricultural vehicles, lawn care equipment, and motorboats.

Biogenic: Emissions generated by living organisms or biological processes such as trees.

Rail (mobile): Includes emissions from locomotives.

Airports (mobile and stationary): Emissions from aircraft, auxiliary power units (APUs) and ground support equipment, including ground power units (GPUs).

Emissions Reduction Bank – stored emission reduction credits (ERCs) from previous emissions reduction projects that may be used to offset future emissions increases.

In Clark County, nearly 71% of summer weekday NOx emissions (tpd) come from on-road and off-road mobile sources, and over 74% of VOC summer weekday emissions (tpd) come from biogenic sources. Transport of pollutants from California into southern Nevada also contributes to elevated ozone concentrations in Clark County during the summer months.

1.3 NATIONAL AMBIENT AIR QUALITY STANDARDS FOR OZONE

There are two federal NAAQS for ozone that establish maximum allowable ambient concentrations of ozone: a primary NAAQS that protects public health, including the health of sensitive populations such as asthmatics, children, and the elderly. The secondary NAAQS protects public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. EPA originally set a NAAQS for ozone in 1971 based on photochemical oxidant concentrations and then subsequently revised that standard four times.

In 1971, EPA originally set a NAAQS based on 1-hour total photochemical oxidant concentrations below 0.08 ppm (a predecessor to the ozone NAAQS). Later, in 1979, EPA revised the form of the standard and level of the NAAQS to a 1-hour ozone NAAQS of 0.12 ppm. Then in 1997, EPA

revised both the averaging time and form of the ozone NAAQS to set both the primary and secondary 1997 ozone NAAQS at a design value concentration of 0.08 parts per million ("ppm") based on a three-year average of the annual fourth-highest daily maximum 8-hour average concentration ("1997 8-hour ozone NAAQS"). Design values at or above 0.085 ppm are considered a violation of this NAAQS. In 2008, EPA lowered the 1997 8-hour ozone NAAQS to a design value of 0.075 ppm without changing the form or averaging time of the standard. In 2015, EPA further lowered that design value to 0.070 ppm. This maintenance plan sets forth Clark County's plan for continued attainment of the 0.08 ppm 1997 8-hour NAAQS, in accordance with state implementation plan requirements for this former NAAQS. Clark County addresses the subsequent NAAQS in separate planning documents.

The following section discusses these NAAQS revisions as they relate to Clark County's attainment and maintenance of those standards.

1.4 HISTORY OF THE CLARK COUNTY NONATTAINMENT AREA

The history of Clark County's ozone air quality planning efforts spans multiple decades through the four NAAQS revisions. EPA's implementation rules and federal court decisions related to those rules also impacted the requirements and submission deadlines for meeting SIP requirements. The following provides a brief overview of these events and efforts.

On March 3, 1978, EPA designated the Las Vegas Valley a nonattainment area for the 1971 photochemical oxidant NAAQS (43 FR 8962). Air quality monitoring data for calendar years 1975 through 1977 showed violations of the 1-hour ozone NAAQS (0.08 ppm) in effect at the time.

On February 8, 1979, the EPA established a primary 1-hour ozone NAAQS of 0.12 ppm (44 FR 8220) and designated the Las Vegas Valley as a nonattainment area for that NAAQS. Thereafter, the DAQ required targeted industries to implement control technologies that curbed precursor pollutants because research demonstrated that industrial processes within Clark County contributed to elevated ozone levels. By the end of 1984, Clark County had implemented a suite of control technologies and completed a SIP demonstrating attainment of the 1979 ozone NAAQS.

In January 1985, the Nevada governor submitted the Clark County ozone SIP to EPA for review and approval. This SIP demonstrated attainment of the 1979 1-hour ozone NAAQS, in accordance with EPA requirements and federal law. In April 1986, the state of Nevada requested that EPA redesignate the Las Vegas Valley as an attainment area and provided documentation showing how control measures and technologies resulted in improved air quality and compliance with the 1979 ozone NAAQS. EPA approved the SIP submission in August 1986, and on November 19, 1986, EPA re-designated the Las Vegas Valley to an attainment area for the 1979 1-hour ozone NAAQS effective January 20, 1987 (51 FR 41788).

Clark County remained in compliance with the 1979 1-hour ozone NAAQS for over a decade. Then, on July 18, 1997, EPA revised the ozone NAAQS (62 FR 38856), replacing the 1979 1-hour 0.12 ppm ozone NAAQS with the 1997 8-hour ozone NAAQS. This rule became effective September 16, 1997.

On June 27, 2003, Clark County submitted a recommendation to the Nevada Department of Environmental Protection (NDEP) that EPA designate Clark County as an attainment area for the 1997 8-hour ozone NAAQS. At that time, the preceding three years of data (2000, 2001, and 2002) indicated that Clark County complied with the 1997 8-hour ozone NAAQS. On July 10, 2003, pursuant to Section 107(d) of the 1990 CAA, the State of Nevada submitted this recommended designation to EPA's Region 9 office. EPA subsequently agreed with the governor's recommendation but noted that it was tracking 2003 ozone monitoring data. That data indicated that Clark County exceeded the NAAQS at one location.

Before acting on the governor's recommended designation, EPA promulgated an implementation rule for the 1997 8-hour ozone NAAQS on April 30, 2004 (69 FR 23951). Both Subpart 1 and Subpart 2 of the CAA contain planning and control requirements for areas designated nonattainment. CAA Subpart 1 contains general requirements that apply to all nonattainment areas for any NAAQS, while CAA Subpart 2 contains requirements specific to ozone classifications based on EPA's 1979 1-hour ozone NAAQS. Under the final rule, EPA would designate ozone nonattainment areas with 8-hour ozone design values above the 1997 8-hour ozone NAAQS under Subpart 2 based on that area's current 1-hour ozone design values. If an area's current design value was below the level of the 1979 1-hour ozone NAAQS (as was Clark County's), but above the 1997 NAAQS (as was Clark County's), then EPA would designate that area as a "basic" ozone nonattainment area under Subpart 1.

Using this approach for designations, EPA on the same day as the promulgation of the implementation rule (April 30, 2004) designated Clark County as a basic nonattainment for the 1997 8-hour ozone NAAQS, to become effective 45 days later. (69 FR 23858). EPA based its decision on the 2001, 2002, and 2003 monitoring data, which showed the area was not meeting the 1997 8-hour ozone NAAQS. Before this designation became effective, however, the Nevada Governor submitted a request to EPA, on May 21, 2004, asking EPA to delay the effective date of this nonattainment designation for Clark County until October 15, 2004 to provide Clark County time to revise its designation recommendation. EPA agreed and promulgated a final rule deferring the effective date of the nonattainment designation to September 13, 2004 (69 FR 34076). The EPA further agreed that relevant factors for defining a nonattainment area might support a different recommendation than the one the state submitted on April 12, 2004. On August 2, 2004, the state submitted a revised recommendation to designate a portion of the County (instead of the entire county) nonattainment for the 1997 8-hour ozone NAAQS. This recommendation encompassed the following hydrographic areas (HAs) in Clark County:

- Ivanpah Valley (HAs 164A, 164B, 165, and 166).
- Eldorado Valley (HA 167).
- Las Vegas Valley (HA 212).
- Colorado River Valley (HA 213).
- Paiute Valley (HA 214).
- Apex Valley (HAs 216 and 217).
- A portion of Moapa Valley (HA 218).

EPA accepted the state's recommendations and issued a final rule on September 17, 2004, delineating the revised boundaries consistent with the included HAs (69 FR 55956). Figure 1-1

shows the areas within Clark County designated as basic nonattainment for the 1997 8-hour ozone NAAQS in this rule.

Subsequently, on December 22, 2006, a three-judge panel from the U.S Court of Appeals for the District of Columbia Circuit vacated EPA's Phase 1 Implementation Rule for the 1997 ozone NAAQS (472 F. 3d 882 (D.C. Cir. 2006)), including use of the basic nonattainment classification under CAA Subpart 1. EPA and other organizations filed petitions for an *en banc* review (review by the entire Court) of the decision. On June 8, 2007, the full Court revised the decision by vacating only certain portions of the Phase I rule. The vacatur, however, included the "basic" classification determinations for nonattainment areas like Clark County. Following the Court's decision, EPA issued a memorandum (dated 6/15/2007) stating that nonattainment areas classified under "Subpart 1 are not currently subject to the June 15, 2007, submission date for their attainment demonstrations." These actions obligated Clark County to develop and submit to EPA in 2008 the *8-Hour Ozone Early Progress Plan for Clark County, Nevada* (DAQEM 2008) to establish motor vehicle emission budgets (MVEBs) for maintaining transportation conformity. The BCC adopted and approved the early action plan on June 17, 2008. EPA formally approved these MVEBs on May 14, 2009 (74 FR 22738).

On March 29, 2011, EPA determined that the Clark County 1997 8-hour ozone nonattainment area attained the ozone NAAQS based on monitoring data from 2007 through 2009 (76 FR 17343). At the same time, DAQEM prepared and submitted a request for EPA to redesignate the nonattainment area to attainment, along with a 2011 maintenance plan for the first ten-year period following redesignation to attainment (DAQEM 2011). EPA approved this submission and formally redesignated the 1997 8-hour ozone nonattainment area to attainment on January 8, 2013. (78 FR 1149)

In the meantime, EPA revised the ozone NAAQS in 2008 to lower the allowable ambient concentration from 0.08 ppm to 0.075 ppm based on the three-year average of the annual fourth-highest daily maximum 8-hour average ozone concentrations (73 FR 16436). The EPA designated the entirety of Clark County as attainment for the 2008 ozone NAAQS, even though it had not yet redesignated portions of the County to attainment for the 1997 ozone NAAQS. (77 FR 30088, May 21, 2012). EPA called such areas with different designations for the two NAAQS "orphan maintenance areas."

Under CAA section 175A(b), states must submit a revision to the first maintenance plan eight years after redesignation to provide for maintenance of the NAAQS for ten additional years following the end of the first 10-year maintenance period. U.S. EPA's final implementation rule for the 2008 ozone NAAQS, however, revoked the 1997 ozone NAAQS and provided that, the CAA no longer required orphan maintenance areas, such as Clark County, to submit a second 10-year maintenance plan. *See* 40 CFR § 51.1105(d) (vacated).

The South Coast Air Quality Management District, among others, challenged EPA's interpretation of the CAA with respect to second 10-year maintenance plan obligations in *South Coast Air Quality Management District v. EPA* 882 F.3d 1138 (D.C. Cir. 2018). The D.C. Circuit sided with the plaintiffs and vacated the portion of the regulations which had removed the CAA's second year maintenance plan requirements for orphan maintenance areas. With this portion of the rule vacated,

Clark County now remains under an obligation to submit a second 10-year maintenance plan for the 1997 ozone NAAQS.

While Clark County continues to maintain ambient ozone concentrations below both the 1997 8-hour ozone NAAQS and the 2008 8-hour ozone NAAQS, EPA, in 2015, revised and lowered the primary and secondary ozone NAAQS again to a maximum concentration of 0.070 ppm based on a 3-year average of the annual fourth-highest daily maximum 8-hour average concentration ("2015 8-hour ozone NAAQS") (80 FR 65292).

In 2016, Nevada recommended that EPA designate HAs 164A, 165, and 212 as nonattainment for the current 2015 8-hour ozone NAAQS based on 2013-2015 monitoring data. On December 20, 2017, EPA notified NDEP through issuance of a 120-day notice letter that it intended to revise the NDEP's recommendation by also designating HA 216 as nonnattainment for the 2015 8-hour ozone NAAQS after considering multiple factors and design value data from 2014-2016 (Strauss 2017; *Also see* 83 FR 651). On February 23, 2018, NDEP responded to EPA's 120-day notice letter and recommended that EPA designate HAs 164A and 165 attainment to reflect 2015-2017 data which demonstrated design values below the 2015 8-hour ozone NAAQS, and designate HA 216 as attainment because meteorological conditions show that this area does not contribute to ambient air quality concentrations in the Las Vegas Valley (Lovato 2018). On June 4, 2018, EPA designated only HA 212 as nonattainment for the 2015 8-hour ozone NAAQS (83 FR 25776).

In 2020, EPA completed its review of the 2015 ozone NAAQS and declined to revise either the primary or secondary standards (85 FR 87256). That decision is under review by the current EPA Administration. Also in 2020, DAQ submitted its emissions inventory and emissions statement requirements for the Las Vegas Valley nonattainment area, *Revisions to the Nevada State Implementation Plan for the 2015 Ozone NAAQS: Emissions Inventory and Emissions Statement Requirements* (DES 2020).

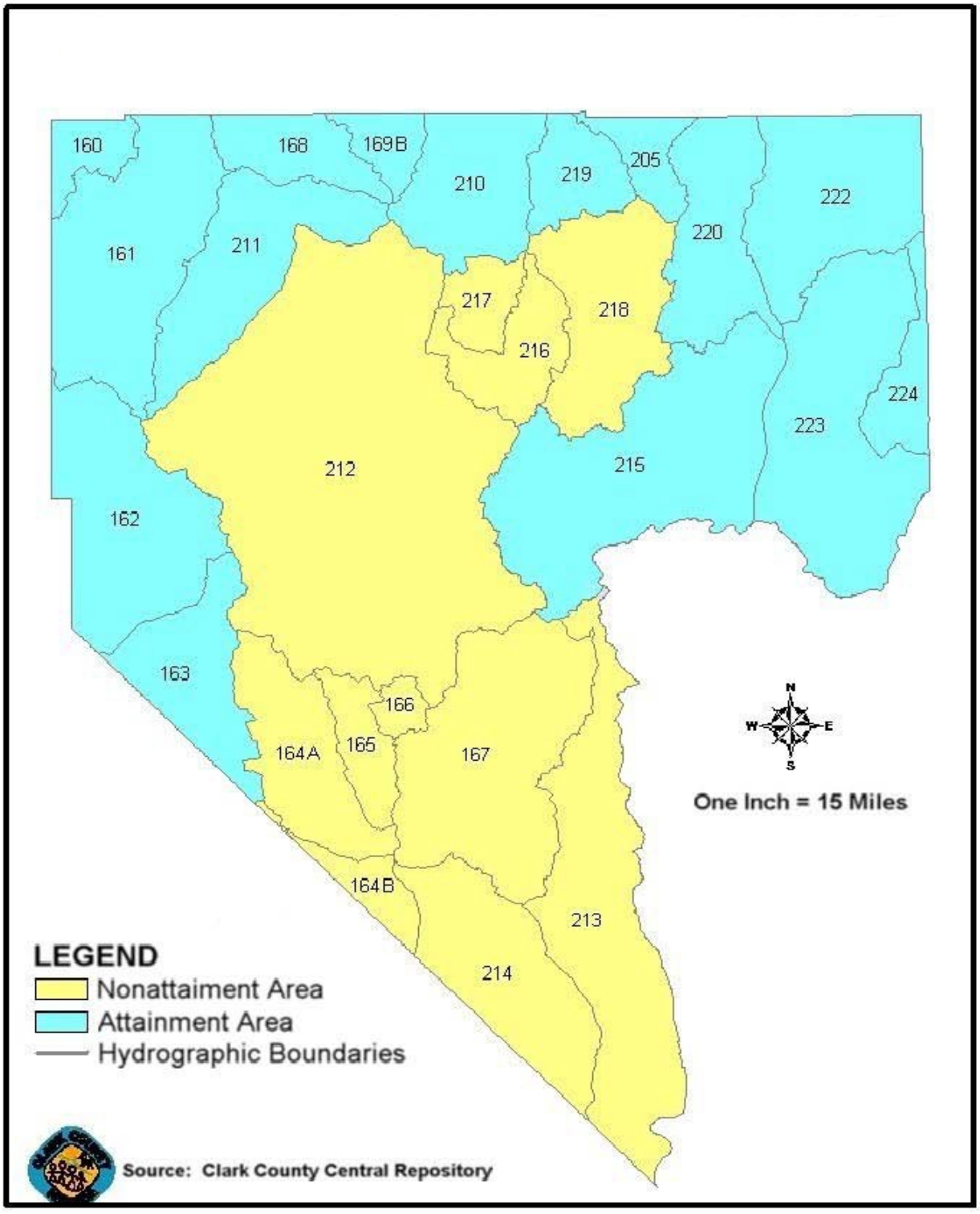


Figure 1-1. Clark County 1997 8-hour Ozone NAAQS Maintenance Area.

1.5 REQUIREMENTS FOR A MAINTENANCE PLAN

CAA Section 175A contains requirements for maintenance plans. This Section provides that a state must submit a revision to the SIP to provide for the maintenance of a NAAQS for at least ten (10) years after the effective date of EPA's re-designation of an area from nonattainment to attainment. This CAA Section further requires that each state submit a second maintenance plan demonstrating how the area will continue to maintain attainment with the NAAQS for an additional 10-year period following the first maintenance period. A state must submit this second maintenance plan eight (8) years after EPA redesignates the area to attainment (42 U.S.C. 7505a).

The CAA does not enumerate specific requirements for an approvable maintenance plan submission other than directing that it contain additional control measures as necessary to ensure continued attainment. (42 U.S.C. 7505a). EPA addressed the contents of an approval maintenance plan in guidance issued in 1992. Under EPA's guidance, EPA recommends that an ozone maintenance plan address:

1. Attainment Inventories (for the ozone NAAQS, this includes VOC and NO_x emissions based on a typical summer day);
2. Maintenance demonstration showing continued attainment for the 10-year maintenance period (using modeling or projected emissions inventories below the attainment year inventory);
3. Commitment to maintain a monitoring network;
4. Verification of attainment of the NAAQS (a method of tracking progress of the maintenance plan); and
5. Contingency plan that provides for measures to bring an area back into attainment if it exceeds the NAAQS in the future ("1992 Calcagni Guidance") (Calcagni 1992).

The 1992 Calcagni Guidance uses the terminology of "contingency measures" for the contingency plan, but explains that these measures are different from the contingency measures required by CAA Section 172(c)(9). For purposes of CAA Section 175A, the maintenance plan needs to identify measures and the procedures for when the state would adopt control measures, including specific triggering indicators and the timeline for state adoption of such measures.

In 2018, EPA issued further guidance reiterating the continued relevance of the 1992 Calcagni Guidance for states required to submit a second maintenance plan for the 1997 8-hour ozone NAAQS. The 2018 guidance explained that states can use limited maintenance plans to demonstrate continued maintenance when the area remains "substantially below the level of the standard (e.g., 85% of the level of the standard), and [if] air quality levels had not been highly variable during the preceding years." For areas that do not meet the criteria for a limited maintenance plan, EPA guidance "instructs states to provide for the maintenance of the [NAAQS] using projected emissions inventories or air quality modeling showing continued maintenance until the end of the relevant period" (U.S. EPA 2018).

1.6 2011 MAINTENANCE PLAN

After EPA designated portions of Clark County nonattainment for the 1997 8-hour ozone NAAQS, the nonattainment area achieved attainment in 2008 based on a design value of 0.082 ppm. Attainment was based on EPA's Clean Data policies (70 FR 71612, 71645-46) considering the three-year average of the 4th highest ozone concentrations for the years 2006-2008. Clark County continued a downward trend in ozone concentrations, and EPA redesignated the Clark County 1997 8-hour ozone nonattainment area to attainment effective February 7, 2013 (78 FR 1149, Jan. 8, 2013). In accordance with CAA requirements, DAQ submitted the 2011 Ozone Maintenance Plan to demonstrate continued attainment with the 1997 ozone NAAQS for the 10-year period, including 2013 through 2022. The EPA approved this plan when EPA redesignated the County to attainment. *Id.* Under CAA Section 175A's directives, the second maintenance period for Clark County includes years 2023 through 2033.

Clark County's 2011 Ozone Maintenance Plan used the Emissions Inventory Method for its maintenance demonstration rather than conducting air quality modeling. The 2011 Ozone Maintenance Plan used 2008 emissions as the attainment year and projected future emissions for the years 2015 and 2022 to demonstrate continued attainment over the first ten-year maintenance period (2013-2022).

The future emission projections reflected federal, state and local rules that permanently reduced NO_x and VOC emissions. DAQ committed to continue to operate the air quality monitoring network and to conduct annual reviews of the State and Local Air Monitoring System ("SLAMS") air quality surveillance system as the means to verify continued attainment with the 1997 8-hour ozone NAAQS.

On October 31, 2018, DAQ submitted a revision to the 2011 Ozone Maintenance Plan to revise the motor vehicle emissions budgets and update the emissions inventory and the maintenance demonstrations based on more current emissions inventory data and computer models ("2018 MVEB") (DAQ 2018). Specifically, DAQ developed the 2011 Ozone Maintenance Plan using Mobile6 motor vehicle emissions model. Since the MVEB continue to be an important planning and compliance tool for transportation conformity, DAQ revised the budget using the most current modeling tool available at that time MOVES2014a and SMOKE-MOVES. DAQ updated the nonroad emissions modeling using NONROAD in the MOVES2014a model.

The 2018 MVEB submission also updated 2008 nonpoint source emissions category by using SMOKE modeling of the 2008 NEI data and 2014 NEI data as a surrogate for 2015 emissions. DAQ then re-projected 2022 emissions using an annual rate of change projection taken from EPA's 2011 Version 6 Air Emissions Modeling Platform.

These updates resulted in a smaller 2008 attainment year emissions budget for VOC but a higher 2008 attainment year emissions budget for NO_x compared to the 2011 Maintenance Plan. Both emissions projections showed greater emissions reductions over the maintenance period for the precursor pollutants.

EPA conditionally-approved the 2018 Revised Maintenance Plan SIP submission on August 27, 2019 (84 FR 44699). The conditional approval required DAQ to reduce the safety margin allocation in the motor vehicle portion of the emissions budgets to assure that the 2018 Revised Maintenance Plan would not interfere with reasonable further progress or attainment of the 2008 or 2015 ozone NAAQS.

DAQ promptly responded to the conditional approval and prepared and submitted a revised MVEB in September 2020 (DES 2020) ("2020 MVEB"). The 2020 MVEB also updated the VOC and NO_x emissions inventory in the 2018 MVEB using 2017 NEI data as the new attainment year emissions and continued to project a reduction in the attainment year emissions inventory through the end of the maintenance period (2022). DAQ revised the on-road and nonroad emissions budgets using the further updated emissions model (MOVES 2014b) and reduced the safety margin applied to the emissions projections.

As previously explained, the EPA originally removed the requirement that orphan maintenance areas submit a second maintenance plan after interpreting the CAA as no longer applying this requirement to these areas when EPA revoked the 1997 ozone NAAQS in its SIP regulations. In *South Coast Air Quality Management District* (2018), the D.C. Circuit Court of Appeals declined to accept EPA's interpretation of the CAA and vacated 40 CFR §51.1105(d) of EPA's rule. This reinstated orphan maintenance areas' obligation to submit a second maintenance plan. Although EPA has not revised its regulations to reflect the D.C. Circuit Court's decision, under the reasoning of that decision and by operation of the CAA, the second maintenance plan submission for the 1997 Clark County 8-hour ozone nonattainment area is now due as of February 2021 (eight years after the effective date of the redesignation). Following the *South Coast Air Quality Management District* decision, Clark County worked diligently to update and revise the 2018 approved SIP revision and the pending 2020 MVEB submissions to prepare this second maintenance plan to meet its CAA Section 175A obligations.

2.0 MAINTENANCE DEMONSTRATION

2.1 INTRODUCTION

The Clark County 1997 8-hour ozone maintenance area continues to attain the 1997 ozone NAAQS. Figure 2-1 shows Clark County's ozone design values for 2008–2020. The design values represent a 3-year average of the fourth highest daily maximum 8-hour concentration registered at a monitor within the area. The fourth-highest value for the respective year is averaged with the two previous years to compute a three-year average value for a monitoring site. The monitoring site with the highest 3-year average defines the design value for the area, assuming the site includes a complete three years of quality assured data. This method for computing ozone design values is codified at 40 CFR Part 50, Appendix I.

Clark County's ozone design value history (Figure 2-1) shows a downward linear trend from 2008 through 2020 despite slight increases in the design values in 2012, 2013, 2014, and 2018. The monitors show that the maintenance area has not experienced greater than a 2 ppb increase in design value since reaching attainment, and the current design value of 74 ppb remains appreciably below the 1997 8-hour ozone NAAQS.

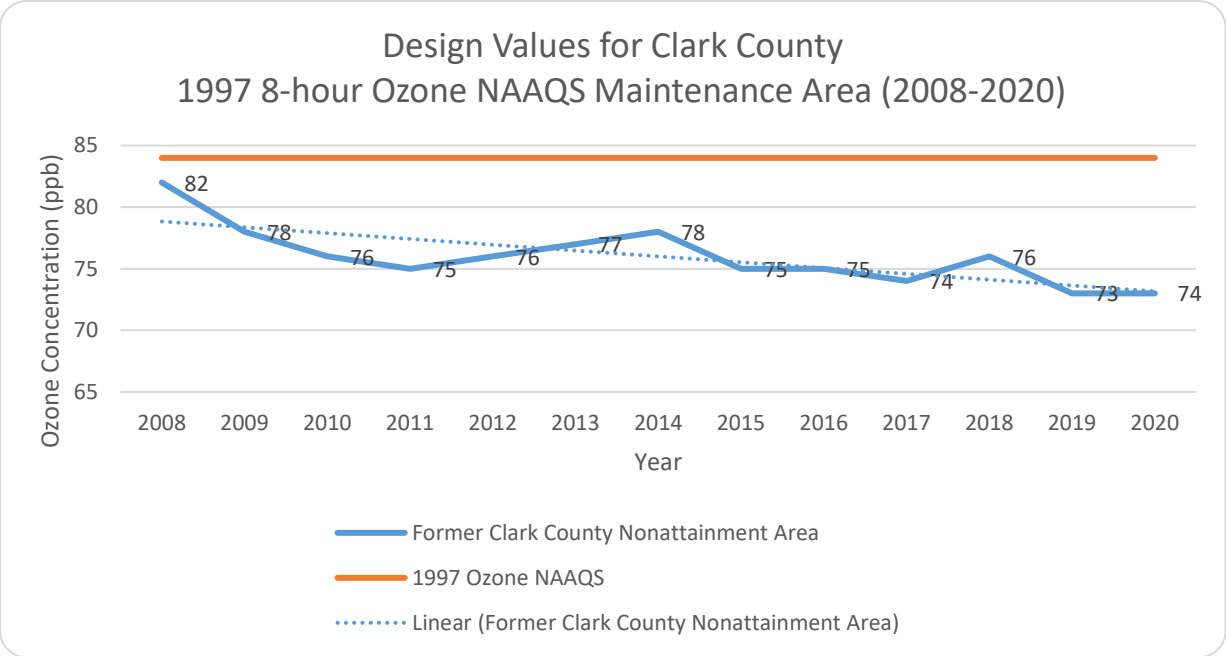


Figure 2-1. Design Values for Clark County 1997 8-hour Ozone NAAQS Maintenance Area.

On June 4, 2018, EPA completed its designation process by designating only HA 212 as nonattainment for the 0.070 ppm 2015 8-hour ozone NAAQS. (83 FR 25776) This action confirms that most of the monitors in the Clark County 1997 8-hour ozone nonattainment area monitored concentrations below 0.070 ppm ozone. Notably, the 2015 ozone design value is greater than 85% below the 1997 8-hour ozone NAAQS design value, and thus, but for HA 212, DAQ could demonstrate continued attainment for the area based solely on monitored values.

2.2 DETAILED HISTORIC VALUES

Tables 2-1 and 2-2 show the 4th highest ozone concentration (ppm) for the years 2017-2020, and the corresponding design value for each monitor for 2019 and 2020. Design Values for the 1997 Clark County 8- hour Ozone Maintenance Area in combination with these tables verify that the Clark County maintenance area remains in attainment with the 1997 8-hour ozone NAAQS, in accordance with the federal requirements of 40 CFR Part 58. The data also depict a downward trend in ozone concentrations in the Clark County maintenance area as shown in Figure 2-1. (*The Apex, Mesquite and Boulder monitoring sites were deactivated after the 2020 ozone season.)

Table 2-1. Three Year Average of the 4th Highest Ozone Concentrations (ppm) by Monitoring Station (2018-2020)

Site Name	Site Code	2018	2019	2020	Design Value (2018-2020)
Apex*	32-003-0022	0.073	0.063	0.067	0.067
Mesquite*	32-003-0023	0.064	0.062	0.064	0.063
Paul Meyer	32-002-0043	0.075	0.069	0.077	0.073
Walter Johnson	32-002-0071	0.076	0.068	0.077	0.073
Palo Verde	32-003-0073	0.072	0.062	0.067	0.067
Joe Neal	32-003-0075	0.076	0.068	0.078	0.074
Green Valley	32-0030-298	0.077	0.070	0.071	0.072
Jerome Mack	32-0030-540	0.075	0.067	0.067	0.069
Boulder City*	32-003-0601	0.069	0.066	0.067	0.067
Jean	32-003-1019	0.072	0.066	0.070	0.069
Indian Springs	32-0037-772	0.073	0.065	0.069	0.069

Source: EPA Air Quality System, (available at: AQS API | AirData | US EPA) last accessed 06/23/2021

Table 2-2. Three Year Average of the 4th Highest Ozone Concentrations (ppm) by Monitoring Station (2017-2019)

Site Name	Site Code	2017	2018	2019	Design Value (2017-2019)
Apex*	32-003-0022	0.069	0.073	0.063	0.068
Mesquite*	32-003-0023	0.062	0.064	0.062	0.062
Paul Meyer	32-002-0043	0.070	0.075	0.069	0.071
Walter Johnson	32-002-0071	0.075	0.076	0.068	0.073
Palo Verde	32-003-0073	0.074	0.072	0.062	0.069
Joe Neal	32-003-0075	0.076	0.076	0.068	0.073
Green Valley	32-0030-298	0.070	0.077	0.070	0.072
Jerome Mack	32-0030-540	0.065	0.075	0.067	0.069
Boulder City*	32-003-0601	0.067	0.069	0.066	0.067
Jean	32-003-1019	0.066	0.072	0.066	0.068
Indian Springs	32-0037-772	0.066	0.073	0.065	0.068

Source: EPA Air Quality System, (available at: AQS API | AirData | US EPA) last accessed 4/28/2021

2.3 PERMANENT AND ENFORCEABLE MEASURES

To achieve attainment of the 1997 8-hour ozone NAAQS, DAQ implemented emissions control measures that lead to a permanent and enforceable improvement in air quality. As outlined in the 2011 Maintenance Plan, these emissions reduction control measures included:

1. Federal Tier 2 vehicle emissions standards (65 FR 6822).
2. Federal highway diesel rule (66 FR 5001).
3. Federal large nonroad diesel engines rule (69 FR 38958).
4. Nonroad spark-ignition engines and recreational engines standards (65 FR 76789).
5. Federal nonroad spark-ignition engines and equipment standards (73 FR 59034).
6. Nevada vehicle inspection and maintenance (I/M) program (Nevada Revised Statutes (NRS) 445B and Nevada Administrative Code (NAC) 445B).
7. Clark County stationary point and nonpoint source air quality regulations (AQRs). (DAQEM 2011)

These emissions control measures will remain in place in the maintenance area through the second maintenance period. Recently, however, the State of Nevada's 81st Legislative Session (which concluded on June 1, 2021) passed Assembly Bill 349 (AB 349) affecting the I/M program. Clark County Chapter 445B in the NRS and the NAC set forth the regulations governing motor vehicles in Clark County. Adopted in 1978 and administered by the Nevada Department of Motor Vehicles, these regulations establish annual testing procedures for 1968 or newer gasoline-powered vehicles, regardless of size, and for diesel-powered vehicles with a manufacturer's gross vehicle weight rating of up to 10,000 pounds.

The Nevada I/M program allows exemptions from emission testing for new vehicles for the first two years of the life of the motor vehicle until AB 349 becomes effective, new hybrid-electric vehicles during their first five model years, alternative fuel vehicles, vehicles registered as Classic Rods or Classic Vehicles and driven for general transportation 5000 miles or less per year, and vehicles registered as Replica Vehicles. In addition, on-board diagnostic testing procedures are used for 1996 and newer vehicles, while older vehicles are tested with a two-speed idle test. The I/M program also includes waiver provisions for motorists who spend $450 on emission-related repairs. No waivers are allowed for vehicles that emit visible smoke.

AB 349 now exempts new motor vehicles from the emissions test requirement for the first three years of the life of the motor vehicle. This change from the current 2-year exemption takes effect on October 21, 2021. DAQ does not expect this change to affect air quality in the maintenance area as newer vehicles are generally less polluting than older models, and newer cars are not expected to have emissions issues the I/M program are designed to detect.

2.4 EMISSIONS INVENTORY METHOD

DAQ selected the Emissions Inventory Method to demonstrate that the 1997 8-hour ozone maintenance area will continue to maintain attainment with the 1997 8-hour ozone NAAQS. This method is explained in the 1992 Calcagni Guidance and in *Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations* (EPA 2017b). Using this method, an area must show

that its future year emissions will be equal to or less than the baseline emissions over the maintenance period. As summarized below, and documented in detail in Appendix A, projected emissions in 2023 and 2033 are below the 2017 baseline year's emissions inventory. Accordingly, DAQ successfully demonstrates continued attainment for the second maintenance period using the Emissions Inventory Method.

2.4.1 Attainment Year Emissions Inventory

For purposes of a maintenance plan, the baseline year to which future years are compared is referred to as the "attainment year emissions inventory." An attainment year emissions inventory should include a 'comprehensive, accurate, current inventory of actual emissions from all sources." (EPA 2017b). The attainment year emissions inventory must also be a year in which the area is attaining the NAAQS as documented through monitoring stations in the area.

For the 2011 Maintenance Plan, DAQEM used 2008 for the entire Clark County area as the attainment year emissions inventory. (DAQEM 2011) This is the first year that the maintenance area reached attainment with 1997 8-hour ozone NAAQS. For this second maintenance plan, DAQ used 2017 as the attainment year inventory. This is the most recent year for which the EPA compiled and verified data for the comprehensive triennial inventory and is also the year DAQ used in the 2018 and 2020 MVEBs. As shown in Figure 2-1, the design value for 2017 was below the 1997 8-hour ozone NAAQS, so the 2017 emissions inventory meets the criteria for an attainment year emissions inventory.

Importantly, the ozone concentration design value for 2017 equaled 0.074 ppm, which is 12% below the 1997 8-hour ozone NAAQS. This means that emissions could go above the attainment year emissions inventory by some amount without elevating ambient ozone concentrations to levels that exceed the NAAQS. Nevertheless, for purposes of the Emissions Inventory Method, DAQ demonstrates that emissions will remain below the 2017 levels.

Table 2-3 shows the 2017 emissions inventory (tpd) for both precursor pollutants, NO_x and VOC, by sector. Note that this inventory differs slightly from the 2017 attainment year emissions inventory submitted in the 2020 MVEB due to refinements of that inventory.

Table 2-3. 2017 Attainment Year Emissions Inventory (tpd)

	2017	
Sector	**NO_x**	**VOC**
Point Source	12.34	2.95
Nonpoint Source	4.69	64.69
Mobile- On-road	42.20	26.27
Mobile- Nonroad	37.45	28.86
Airports	11.90	1.96
Locomotive	1.42	0.07
Emission Reduction Bank	0.00	0.00
Biogenic	2.43	362.61
Total	**112.43**	**487.41**

2.4.2 Attainment Demonstration

For ozone, the baseline year's emissions for NO_x and VOC are compared to future year projections on a ton per day (tpd) basis for a typical summer weekday (EPA 2017b). For the second maintenance plan period, DAQ projected future summer weekday emissions for 2023 and 2033 -- the first year of the second maintenance period and the final year of the second maintenance period.[1]

Appendix A describes DAQ's methodology for developing emissions inventory projections for NO_x and VOC for the second maintenance plan in detail. In brief, as with the 2011 Maintenance Plan, the second maintenance plan includes emissions inventories for eight sectors: on-road mobile, nonroad mobile, point sources, nonpoint sources, biogenic, commercial and federal aviation (airports), locomotive, and banked emission reductions credits. DAQ used local activity data to project future commercial airport emissions and conducted MOVES3 modeling to project future on-road and nonroad mobile emissions.

For the other categories, DAQ generally developed future year growth adjustment factors (GAFs) for the point, nonpoint, federal aviation, and locomotive sectors based on EPA's 2016 v.1 modeling platform data. The modeling platform is a collaborative effort between EPA, state/local emission inventory staff, multijurisdictional organizations, and others to develop an emissions modeling platform for use in photochemical modeling for the 2015 ozone NAAQS and other regulatory actions. It includes a base year of 2016 emissions and then projects emissions for 2023 and 2028. EPA encourages air agencies to use the data and documented approaches in the emissions modeling platform in making their own projections. "EPA's 'emissions modeling platform'…[include] data and thoroughly documented approaches [that] can help air agencies to develop and improve their own emissions projections" (EPA 2017b).

Tables 2-4 and 2-5 summarize the VOC and NO_x emissions projections for each sector and the total emissions changes for Clark County over the maintenance period. These inventories are further documented in tables located in Appendix A.

[1] The U.S. EPA redesignated Clark County to attainment for the 1997 8-hour ozone NAAQS on January 8, 2013. Accordingly, the second maintenance period runs from January 8, 2023 through January 7, 2033. Although the second maintenance period ends before the 2033 ozone season, U.S. EPA Region 9 requested that DAQ include the 2033 ozone season in its emissions inventory projections.

Table 2-4. Total Summer Weekday VOC Emissions Projections by Sector (tpd)

Sector	Attainment Year Inventory 2017 VOC	Projected Inventory 2023 VOC	Projected Inventory 2033 VOC	Emissions Change (2017-2033)
Point Source	2.95	2.62	2.63	-0.32
Nonpoint Source	64.69	67.83	71.31	6.62
Mobile- On-road	26.27	17.85	11.50	-14.77
Mobile- Nonroad	28.86	27.24	27.82	-1.04
Airports	1.96	2.64	3.05	1.09
Locomotives	0.07	0.05	0.04	-0.03
Emission Reduction Bank	0.00	0.43	0.43	0.43
Biogenic	362.61	362.61	362.61	0.00
Total	**487.41**	**481.27**	**479.39**	-8.02

Table 2-5. Total Summer Weekday NO_x Emissions Projections by Sector (tpd)

Sector	Attainment Year Inventory 2017 NO_x	Projected Inventory 2023 NO_x	Projected Inventory 2033 NO_x	Emissions Change (2017-2033)
Point Source	12.34	11.41	11.33	-1.01
Nonpoint Source	4.69	5.03	4.78	0.09
Mobile- On-road	42.20	22.22	11.13	-31.07
Mobile- Nonroad	37.45	23.27	15.37	-22.08
Airports	11.90	15.53	19.77	7.87
Locomotives	1.42	1.21	0.96	-0.46
Emission Reduction Bank	0.00	22.23	22.23	22.23
Biogenic	2.43	2.43	2.43	0.00
Total	**112.43**	**103.33**	**88.00**	-24.43

These emissions projections show that future year summer weekday emissions (tpd) for both VOC and NO_x will be below the 2017 attainment year emissions inventory. Because emissions in 2023 and 2033 are below the 2017 attainment year emissions, DAQ demonstrates continued attainment for the second maintenance period. Figure 2-2 illustrates that biogenic emissions dominate the VOC emissions inventory from the baseline year through the end of the second maintenance period in 2033 with a total of 74-76% of the emissions. DAQ projects a 7% emissions reduction from other sectors by 2033.

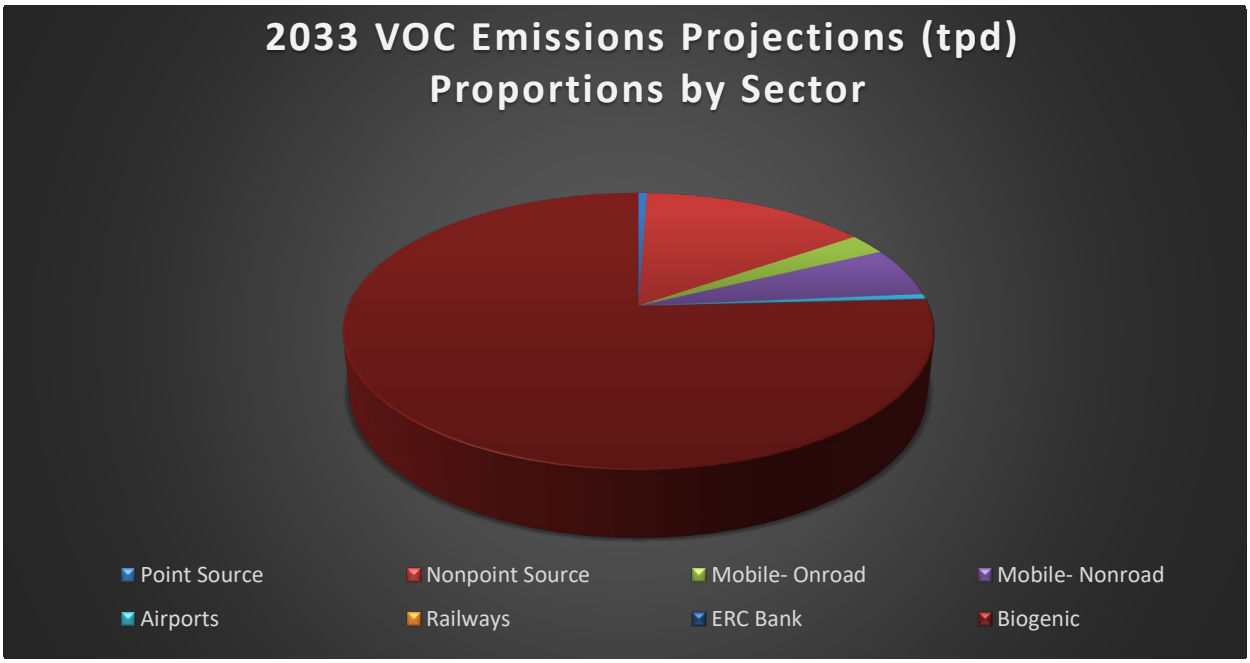


Figure 2-2. 2033 VOC Emissions Projections (tpd) Proportions by Sector.

The total emissions in Clark County from the sectors show a decrease from 2017 to 2033 of 24.43 tpd NO_x and 8.02 tpd of VOC. The largest decreases come from the on-road and nonroad mobile sectors for both pollutants. The total projected emissions include emissions increases from potential use of banked emission reduction credits (ERC). If none of these ERCs are used, then the margin of emissions decreases for NO_x would nearly double; for VOC, the margin would increase by over 5%.

On-road mobile emissions dominated the 2017 NO_x emissions inventory by comprising approximately 38% of that inventory. Mobile source emissions from the nonroad sector followed by comprising 33% of the 2017 NO_x inventory. The 2033 emissions projections show that these two sectors will continue to be dominant sources of summer weekday emissions, but as emissions decrease from these sectors and emissions increase from the airport sector, the airport sector will become the dominant source of NO_x emissions by 2033 (not considering the ERC bank). By 2033, airports comprise 22% of the inventory, while on-road and nonroad mobile emissions decline to 13% and 18% of the emissions inventory, respectively. Interestingly, the NO_x ERC banked emissions comprise the largest (albeit potential) sector by 2033; those emissions will occur only to the extent that a proposed new source or modification acquires some or all those credits to offset its proposed emissions increase. Therefore, the ERC emissions represent potential emissions increases; including all the ERC in the inventory is a very conservative approach that likely overstates actual 2033 emissions.

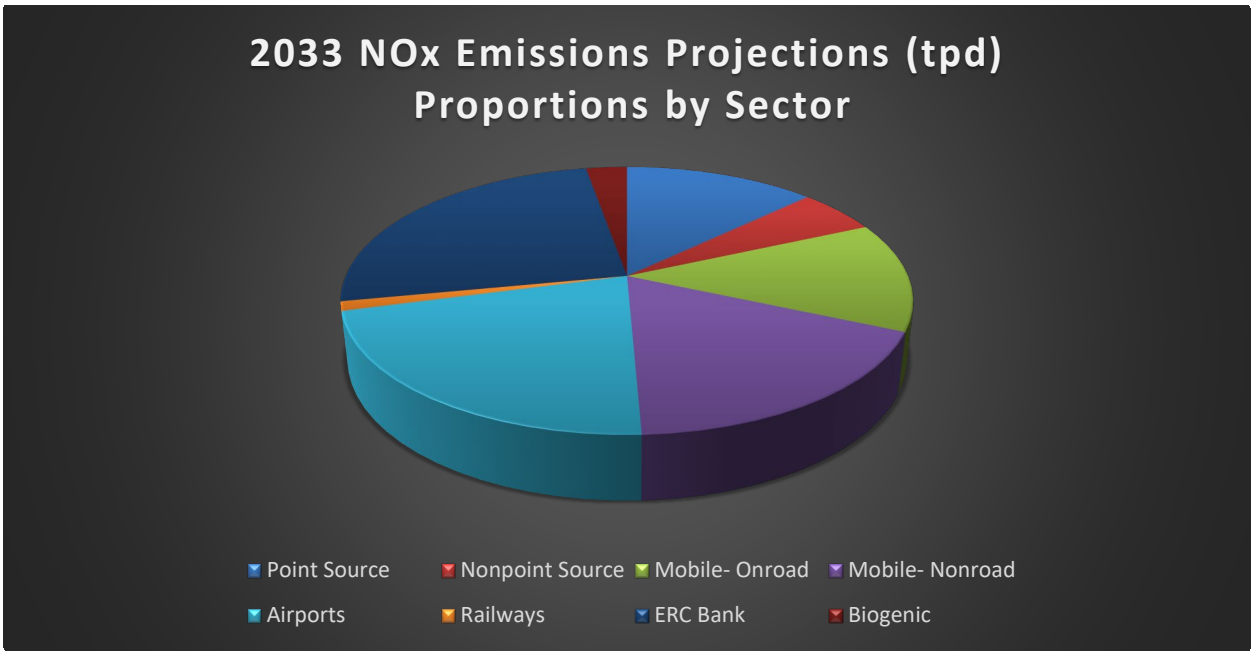


Figure 2-3. 2033 NO_x Emissions Projections (tpd) Proportions by Sector.

3.0 MONITORING NETWORK

DAQ will continue to operate a network of ambient air monitoring stations to comply with EPA requirements and guidance to characterize ambient air quality in Clark County. Title 40, Part 58 of the Code of Federal Regulations (40 CFR Part 58 including Appendices A, B, C, D and E) defines the requirements for the ambient air quality monitoring programs mandated by the CAA. Under these rules, every state must establish a monitoring network for criteria air pollutants that meets location and operation specifications. Monitors used to satisfy these requirements are called State and Local Air Monitoring Stations ("SLAMS"). DAQ operates multiple SLAMs monitors in its network that are designed to monitor for ozone.

DAQ also may operate Special Purpose Monitors. These monitors are used to meet short-term or specific monitoring goals. As outlined in 40 CFR 58.20, Special Purpose Monitors ("SPMs") do not have to meet the same requirements as SLAMS monitors; instead, 40 CFR § 58.20 requires that SPMs comply with Appendix A. To obtain specific, targeted information and to maintain flexibility, DAQ does not operate SPMs in full compliance with 40 CFR Part 58 Appendix E Sections 2, 3, 4, 5, 6, or 9. Table 3-1 includes a list of current and historic monitoring sites in Clark County.

Each year DAQ is required to submit an annual network plan to EPA. DAQ submitted its 2020 annual network plan to EPA on June 2, 2020 and received approval of the plan on October 28, 2020. DAQ's 2021 Monitoring plan underwent public review until May 6, 2021, and the final plan submitted to EPA will address all comments received on the plan during the public comment period.

The current ozone ambient air monitoring network in Clark County (Table 3-1 and Figure 3-1) consists of nine stations located inside the Las Vegas Valley (Jerome Mack, Paul Meyer, Walter Johnson, Palo Verde, Joe Neal, Mountains Edge, Green Valley, Liberty High School, Walnut) and four (Virgin Valley, Indian Springs, Jean, Garrett High School) located outside the valley. Additionally, the Spring Mountain Youth Camp (EPA Site ID 32-003-7771) is operated as a special purpose monitoring site, and the Las Vegas Paiute monitor (EPA Site ID 32-003-8000) is operated by the Paiute tribe. The Las Vegas Paiute monitor is not part of DAQ's ozone monitoring network; it is considered non-regulatory, and the data cannot be used for NAAQS purposes.

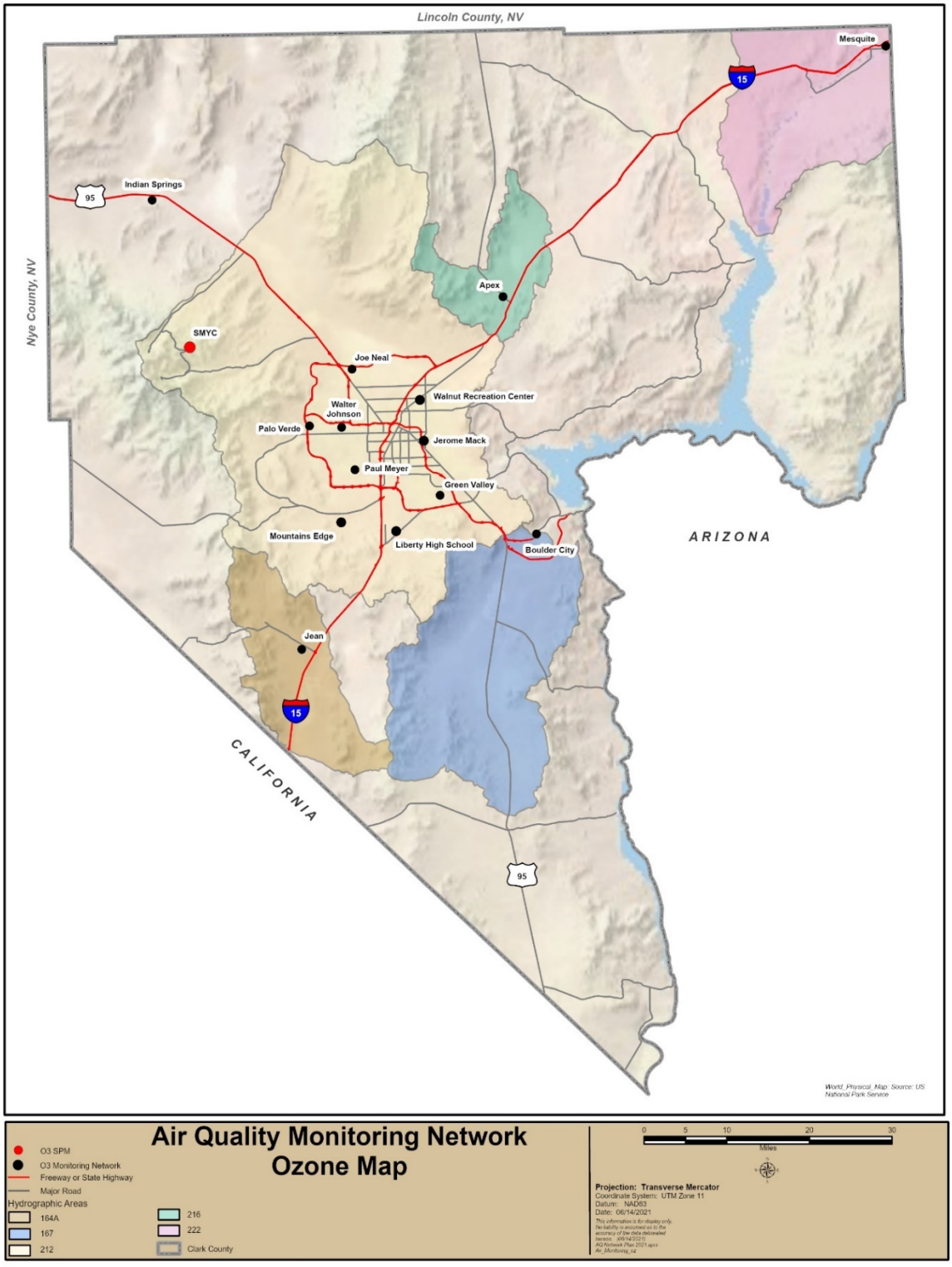
Readers can access more information on a specific monitor at Clark County Region Monitor Summary (https://clarkcountynvairquality.meteostar.com/cgi-bin/monitors.pl) or by reviewing the most recent annual monitoring network plan. As previously highlighted, Tables 2-1 and 2-2 in the previous section show the three-year averages of the fourth-highest ozone concentrations measured at these stations from 2017-2020.

Table 3-1. Clark County Ozone Monitoring Sites

CAMS	EPA Site	Site Description	Street Address	City	Current Status
8000	32-003-8000	Las Vegas Paiute	off Paiute Way	Las Vegas	Active as of Apr. 1, 2015; run by Paiute Tribe
540	32-003-0540	Jerome Mack	4250 Karen Ave	Las Vegas	Active as of Aug. 27, 2010
24	32-003-0024	Virgin Valley	820 Valley View Dr	Mesquite	Active as of Dec. 9 2020, but data not used for Regulatory Purposes
7772	32-003-7772	Indian Springs	668 Gretta Ln	Indian Springs	Active as of May 11, 2020; collecting transport data during ozone season
1019	32-003-1019	Jean	1965 State Hwy 161	Jean	Active as of Jan. 1, 2003
43	32-003-0043	Paul Meyer	4525 New Forest Dr.	Las Vegas	Active as of Jan. 1, 2003
71	32-003-0071	Walter Johnson	7701 Ducharme Dr.	Las Vegas	Active as of Jan. 1, 2003
73	32-003-0073	Palo Verde	126 S. Pavilion Center Dr.	Las Vegas	Active as of Jan. 1, 2003
75	32-003-0075	Joe Neal	6076 Rebecca	Las Vegas	Active as of Jan. 1, 2003
298	32-003-0298	Green Valley	298 North Arroyo Grande	Henderson	Active as of June 4, 2015
44	32-003-0044	Mountains Edge	8101 Mountains Edge Parkway	Las Vegas	Active as of Sept. 29, 2020
602	32-003-0602	Garrett Junior High	1200 Ave G	Boulder City	Active as of March 18, 2021
299	32-003-0299	Liberty High School	3700 Liberty Heights Ave	Henderson	Active as of May 1, 2021
2003	32-003-2003	Walnut	3075 N Walnut Rd	Las Vegas	Active as of May 13, 2021
9995	32-003-9995	Gravimetric Laboratory	4701 West Russell Rd	Las Vegas	Not Yet Active
601	32-003-0601	Boulder City	1005 Industrial Road	Boulder City	Deactivated Mar 12, 2021; replaced by Garrett Junior High Monitor
2002	32-003-2002	J.D. Smith	1301B Tonopah Ave., North Las Vegas 89030	North Las Vegas	Deactivated Jan. 1, 2018
538	32-002-0071	Winterwood	7701 Ducharme Ave., Las Vegas 89145	Las Vegas	Deactivated Oct. 1, 2014
22	32-003-0022	Apex	12101 Hwy 91, Nevada Las Vegas, NV 89165	Apex	Deactivated Oct. 1, 2020
23	32-003-0023	Mesquite	465 East Old Mill Road	Mesquite	Deactivated Oct. 1, 2020
72	32-003-0072	Lone Mountain	3525 N. Valadez St.	Las Vegas	Deactivated April 27, 2010
1021	32-003-1021	Orr	1562 E. Katie Ave. Suite D	Las Vegas	Deactivated Apr. 23, 2010
7780	32-003-7780	Logandale	3570 Lyman Street	Logandale	Deactivated on Oct. 15, 2015, monitor not used for Regulatory Purposes

DAQ stores data from these monitors electronically on a data-logger at each monitoring site. DAQ retrieves this data wirelessly and stores the data electronically on DAQ's servers. After assuring the data meets air quality assurance requirements for ozone (> 75% (average) daily maximum, 75% completeness in a year; ≥ 75% of hours in 8-hour period; at least 18 of 24 running 8-hour averages), DAQ transmits the data to EPA's Air Quality System database. This data is available for public review on EPA's Air Data website at: https://www.epa.gov/outdoor-air-quality-data and DAQ's Air Quality in Clark County website at: Yearly Summary Report By Site (https://clarkcountynvairquality.meteostar.com/cgi-bin/select_year.pl).

DAQ collects and verifies ozone monitoring data under an approved Quality Management Plan (QA Office Document Control Number AIRP0279PV2, Mar. 10, 2017) (DAQ 2017) and Quality Assurance Project Plan (QAPP) for Criteria Pollutant and NCore monitoring (DES 2021), which was last revised and approved on February 16, 2021 in accordance with 40 CFR 58, Appendix A. DAQ also follows EPA's guidance *Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II* (available at: https://www.epa.gov/sites/production/files/2020-10/documents/final_handbook_document_1_17.pdf) (EPA 2017a) Formal quality assessments are an integral part of the DAQ monitoring plan and DAQ follows its QAPP to assure acceptable quality of data is produced from the monitoring network.



* The Boulder City location is the site of the new Garrett High School Station monitor, and the Apex location ceased operating a monitor on October 1, 2020 but a new monitoring location is currently under construction nearby to the Apex location.

Figure 3-1. Clark County Ozone Monitoring Stations

4.0 VERIFICATION OF CONTINUED ATTAINMENT

DAQ will verify continued attainment of the 1997 8-hour ozone maintenance area by continuing to operate an ozone monitoring network in accordance with EPA requirements, and by continued participation in periodic updates of the emissions inventory through the comprehensive triennial national emissions inventory.

EPA regulations require States to collect and submit actual annual emissions for sources on a triennial basis. For ozone, states may submit emissions for NO_x and VOC based on summer day emissions. For large point sources, states must collect and submit this information annually. *See* 40 CFR Part 51, Subpart A. DAQ will prepare complete triennial emissions inventories for 2023, 2026 and 2029 during the second maintenance period. These inventories will provide DAQ with data to compare to the attainment year emissions inventory and monitored data to assess emissions trends and assure continued attainment of the 1997 8-hour ozone NAAQS.

5.0 CONTINGENCY MEASURES PLAN

CAA Section 175A(d) requires that a maintenance plan contain "contingency provisions, as necessary, to promptly correct any violation of the NAAQS that occurs…" (Calcagni 1992). DAQ need not adopt specific measures that will take effect without further action, but instead must identify measures to adopt in the future based on triggering events. Specifically, the contingency plan should include:

1. An explanation of the tracking and triggering mechanisms that will determine when contingency measures may be needed;
2. A description of the process for recommending and implementing contingency measures, with specific timelines for action;
3. A list of potential contingency measures.

The triggering of a response in the contingency measure plan does not automatically require a revision of the Clark County ozone SIP, nor would EPA redesignate Clark County for the 1997 8-hour ozone NAAQS, because EPA has withdrawn those standards. Instead, Clark County will address the increased ambient ozone concentrations by implementing one or more contingency measures, as appropriate. If the maintenance area continues to experience elevated ozone concentrations after implementing the contingency measures, DAQ will adopt additional measures until the design values are reduced below the level of the 1997 8-hour ozone NAAQS.

5.1 TRACKING AND TRIGGERING MECHANISMS

As explained in Section 3.0, DAQ will continue to monitor ozone ambient air concentrations and the emissions inventory to determine whether the maintenance area is at risk of exceeding the 1997 8-hour ozone NAAQS. In addition, the Regional Transportation Commission of Southern Nevada (RTC) serves as another means of tracking mobile source VOC and NO_x emissions. RTC revises its transportation improvement plan every three years and these revisions are subject to a transportation conformity finding; that process will serve as a periodic check on whether emissions are consistent with the VMT and MVEB projections of this second maintenance plan.

5.2 ACTION RESULTING FROM TRIGGER ACTIVATION

Within 45 days of confirming this event, DAQ will notify EPA that an internal review process began to evaluate and adopt contingency measures, if appropriate. Within 90 days of that notification, DAQ will send EPA a draft report outlining recommended actions. DAQ will then solicit stakeholder involvement through public forums (i.e., ozone working groups) to refine the contingency measure list and hold a public hearing(s) to accept comment on the draft contingency measure list. DAQ will finalize the contingency measure list and begin implementation of the necessary measures within 18 months after finalizing the list.

5.3 POTENTIAL CONTINGENCY MEASURES

In addition to the six potential contingency measures outlined below, Clark County may evaluate other strategies to address any future ozone NAAQS violations in the most appropriate and effective manner practicable.

5.3.1 Reid Vapor Pressure Reduction

In conjunction with the Nevada Department of Agriculture, Clark County may consider requiring the reduction of gasoline Reid vapor pressure to below 9.0 psi within the nonattainment area during the summer ozone season.

5.3.2 Inspection/Maintenance Program Changes and Additions

In conjunction with the Nevada Department of Transportation, Clark County may consider changing the cut points for VOCs and NOx applicable to pre-1996 vehicles and/or increase the I/M waiver repair rate in Clark County.

5.3.3 Consumer and Commercial Products

Clark County may consider regulations to restrict the sale, offer for sale, or manufacture for sale of any consumer product, such as personal care products, automotive and industrial maintenance products, and pesticides that contain VOCs above specified limits.

5.3.4 Architectural Surface Coatings

Clark County may consider regulations to restrict the sale, supply, offer for sale, or solicitation of the application of architectural coatings that contain VOCs above specified limits.

5.3.5 Lawn and Garden Equipment Use

Clark County may consider regulations to restrict the use of gasoline-powered lawn mowers on announced ozone action days in the Clark County nonattainment area.

5.3.6 Establish/Enhance Trip Reduction Programs

In conjunction with the RTC, Clark County may establish and/or enhance employer-based community outreach and marketing efforts, employer rideshare program incentives, preferential parking for carpoolers and vanpoolers, emergency rides home for Club Ride members, travel assistance information on the Internet, and a public kiosks, transit passes to subsidize employees' transit expenses, and partnerships with vanpool leasing companies.

6.0 CONFORMITY

Conformity is required by CAA Section 176(c). EPA's transportation and general conformity rules apply to nonattainment and maintenance areas operating under maintenance plans. Under either rule, one means of demonstrating conformity of federal actions is to show that expected emissions from planned actions are consistent with the emissions budget for the area. This section contains transportation and general conformity provisions applicable in maintenance areas.

6.1 TRANSPORTATION CONFORMITY

The transportation conformity process ensures transportation plans, programs, and projects in maintenance areas do not create new violations of the NAAQS, do not increase the frequency or severity of NAAQS violations, and do not delay timely attainment of the NAAQS. It does not allow federal agencies to engage in, support, or provide financial assistance for licensing, permitting, or approving any project unless the project conforms to the SIP.

6.1.1 Motor Vehicle Emissions Budgets

Under CAA Section 176(c), transportation plans, programs, and projects in maintenance areas that are funded or approved under Title 23 of the U.S. Code or the Federal Transit Act must conform to the on-road MVEBs specified in the applicable SIP. In this case, 40 CFR § 93.118 provides the criteria and procedures for MVEBs.

The MVEB establishes a cap on motor vehicle-related emissions that cannot be exceeded by predicted transportation system emissions. The emissions budget applies as a ceiling on emissions in the year for which it is defined, and for all subsequent years until a different budget is defined for another year or a SIP revision modifies the budget. Unless the SIP clearly indicates otherwise, the estimate of future transportation network emissions used in the milestone or attainment demonstration acts as the MVEB.

In 2018, DAQ submitted a revision to the MVEB for 2008, 2015, and 2022 for use in conducting future transportation conformity determinations (DAQ 2018). The budgets in the updated MVEB consisted of the updated on-road emissions estimates for 2008, 2015 and 2022 with an added safety margin. DAQ determined the safety margin by adding 80% of the difference between the attainment year inventory and projected emissions to the total projected on road mobile emissions for 2015 and 2022. EPA conditionally approved this MVEB in 2019. The conditional approval required DAQ to submit another revision to the MVEB to lower the safety margin allocation. In DAQ's commitment letter, DAQ indicated it would reduce the safety margin to approximately 3 tpd, which equaled about 50% of the difference between the 2015 and 2022 total emissions projections in the 2018 MVEB (Bechtel 2019). Table 6-1 shows the currently approved MVEB.

Table 6-1. Conditionally-Approved State Implementation Plan Motor Vehicle Emissions Budget (tpd)

	2008	2015	2022
VOC	42.46	53.94	52.96
NO_x	89.5	90.92	86.74

In 2020, DAQ submitted a revised MVEB based on using 2017 as an interim year and projecting 2022 emissions. Consistent with the commitment letter, DAQ added 50% of the difference in the years' total emissions projections as a safety margin. DAQ used the most current EPA-approved motor vehicle emissions model at that time (MOVES2014a) and the most current planning variables (*e.g.*, vehicle miles traveled projections and populations forecasts) which resulted in a slight increase in the on-road mobile sector emissions compared to the 2018 MVEB update. With the reduced safety margin allocation, however, the submitted MVEB was smaller than the 2018 conditionally-approved budget. Table 6-2 shows the proposed MVEB in the 2020 submission.

Table 6-2. 2020 Motor Vehicle Emission Budget (tpd) Submission for 2022

NO_x	VOC
32.16	23.92

This second maintenance plan further revises the VOC and NO_x on-road mobile sector using the latest EPA modeling tool – MOVES3. The revised modeling projected lower on-road mobile emissions for both VOC and NO_x compared to the 2020 MVEB submission. Tables 6-3 and 6-4 display the new projected on-road emissions budget with 50% of the difference in total emissions projections for the years added as a safety margin.

Table 6-3. VOC MVEB Second Maintenance Plan (tpd)

Parameter	2017	2023	2033
Projected VOC Emissions (tpd)	26.27	17.85	11.50
Safety Margin Adjustment (tpd)		3.07	4.01
MVEB VOC (tpd)	26.27	20.92	15.51

Table 6-4. NO_x MVEB Second Maintenance Plan (tpd)

Parameter	2017	2023	2033
Projected Emissions (tpd)	42.20	22.22	11.13
Safety Margin Adjustment (tpd)		4.55	12.22
MVEB NO_x (tpd)	42.20	26.77	23.35

Once approved by EPA, these MVEB will be used in future transportation conformity analyses.

6.2 GENERAL CONFORMITY

The general conformity process ensures that actions taken by federal agencies do not interfere with a state's plans to meet the NAAQS. General conformity determinations are required whenever there is a federal action, other than transportation related, within a nonattainment or maintenance area that will increase emissions above a de minimis level. A federal agency must demonstrate that actions it undertakes or supports will conform to the applicable SIP. Federal rules require that federal agencies use the emissions inventory from an approved SIP to support a conformity determination. One method for demonstrating that an action conforms to the SIP is specifically identifying and accounting for the anticipated emissions from the proposed action in the attainment or maintenance demonstration.

The airport emissions in the attainment demonstration (Section 2.4.2) include all estimated NO_x and VOC emissions for the proposed Southern Nevada Supplemental Airport (SNSA) and proposed Air Force Training Project. These emissions may be used to support a general conformity determination in accordance with 40 CFR 93.158. Details on these projects and associated emissions are provided below.

6.2.1 Southern Nevada Supplemental Airport

On May 20, 2020, Clark County through NDEP submitted a letter committing to include all operational NO_x and VOC emissions from the proposed SNSA in its second 10-year maintenance plan. These emissions are included in the airport emissions estimates for 2033. Table 6-5 shows the estimated operational NO_x and VOC emissions from the proposed SNSA.

Table 6-5. SNSA Proposed Emissions (tpd)

SNSA	2033
NO_x	4.68
VOC	0.35

6.2.2 Proposed Air Force Training Project

The Department of Air Force (DAF) is proposing to provide dedicated Contracted Close Air Support (CCAS) training for students at NAFB. The DAF proposed action involves flight and ground support operations at the North Las Vegas Airport and Jean Sport Aviation Center, and the aircraft would engage in training exercises in Special Use Airspace outside of Clark County. The proposed action is tentatively scheduled to begin on January 1, 2022, and end on December 31, 2031 (10 years). Details on the project and the methodology for estimating emissions are provided in Appendix A. Table 6.6 shows the estimated NO_x and VOC emissions from the project.

Table 6-6. DAF Proposed Emissions (tpd)

DAF Training Project	Total Annual (ton/year)	Summer Weekday (tpd)	2023 (tpd)	2033 (tpd)
NO_x	127.741	0.49	0.49	0.49
VOC	20.192	0.08	0.08	0.08

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APPENDIX A

Technical Support Document

December 2021

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1.0 INTRODUCTION

1.1 BACKGROUND ON EMISSIONS PROJECTION METHOD

This Technical Support Document describes the development of the emissions inventory projections for NO_x and VOC for the second maintenance plan for the 1997 8-hour ozone National Ambient Air Quality Standards (NAAQS) maintenance area in Clark County, Nevada. The Department of Environment and Sustainability, Division of Air Quality (DAQ) developed estimated emission inventories for the years 2023 and 2033. The emissions inventories include eight sectors: on-road mobile, nonroad mobile, point sources, nonpoint sources, biogenic, airport (commercial and federal aviation), locomotive, and banked emission reductions credits. Chapters 2-9 detail the methodology and results for each of these sectors, while Chapter 10 includes tables with more detailed data results.

DAQ used the 2017 national emissions inventory (NEI) data as the baseline for projecting future emissions for point, nonpoint and locomotive sources. The 2017 emissions inventory year is the most recent year for which the U.S. Environmental Protection Agency (EPA) compiled and verified data for the comprehensive triennial inventory. DAQ also used this year as the base year for the recent 2020 Motor Vehicle Emissions Budget (MVEB) update (DES 2020). EPA released the National Emissions Inventory (NEI) for 2017 on April 30, 2020. The future projection years are 2023 and 2033, the first year of the second maintenance period and the final year of the second maintenance period[1], respectively. The pollutants DAQ evaluated in these emissions inventories projections were the primary ozone precursors, nitrogen oxides (NO_x) and volatile organic compounds (VOCs).

DAQ used 2017 actual emissions activity data to develop the 2017 base year ozone inventory and projected activity data to develop the 2023 and 2033 future year ozone inventory, following the EPA guidance document titled "Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations" (EPA 2017). The primary data sources for the base year and future year inventories were local specific activity data, the 2017 NEI, the EPA 2016 v.1 modeling platform data (EPA 2021), and MOVES3 modeling.

The modeling platform is a collaborative effort between EPA, state/local emission inventory staff, multijurisdictional organizations, and others to develop an emissions modeling platform for use in photochemical modeling for the 2015 ozone NAAQS and other regulatory actions. EPA encourages air agencies to use the data and documented approaches in the emissions modeling platform in making their own projections. "EPA's 'emissions modeling platform'…[include] data and thoroughly documented approaches [that] can help air agencies to develop and improve their own emissions projections." (EPA 2017) In view of this, DAQ used the 2023 and 2028 emissions projections from the modeling platform to develop emission growth adjustment factors (GAFs) for the point, non-point, federal aviation, and locomotive categories. DAQ used local activity data to project commercial airport emissions and conducted MOVES3 modeling to project on-road and non-road mobile emissions.

[1] The U.S. EPA redesignated Clark County to attainment for the 1997 8-hour ozone NAAQS on January 8, 2013. Accordingly, the second maintenance period runs from January 8, 2023 through January 7, 2033. Although the second maintenance period ends before the 2033 ozone season, U.S. EPA Region 9 requested that DAQ include the 2033 ozone season in its emissions inventory projections.

This approach presents a more refined approach for computing future year emissions than methods EPA already approved for use in other states. For example, the Wisconsin Department of Natural Resources (WI DNR) used the 2011 version 6.3 modeling platform data and assumed emissions modeled for 2028 remained steady through 2033 (WI DNR, 2019; 85 FR 36342). Similarly, the Ohio Environmental Protection Agency (OH EPA) used modeled values from the 2000 version 6.3 modeling platform for its maintenance year emissions inventory (OH EPA, 2019; 84 FR 52001).

1.2 EMISSION SUMMARY FOR ALL SECTORS

Tables 1-1 and 1-2 show the ton per summer (July) weekday inventory for 2017 and projected ton per summer weekday emissions for 2023 and 2033. Table 1-1 shows that the Biogenic sector dominates the VOC emissions inventory from the baseline year through the end of the second maintenance period in 2033. Biogenic emissions comprise a total of 74-76% of the emissions through the second maintenance period.

Table 1-2 shows that mobile source, on-road emissions dominated the 2017 NO_x emissions inventory, comprising approximately 38% of that inventory. Mobile source emissions from the non-road sector followed, comprising 33% of the NO_x inventory. Emissions projections show that these two sectors will continue to be dominant source of weekday ton per day (tpd) emissions, but as emissions decrease in these sectors and emissions increase from the airport sector, the airport sector will become the dominant source of NO_x by 2033. Airports are predicted to increase emissions and comprise 22% of the inventory, while on-road and non-road mobile emissions decline to 13% and 18%, respectively.

The overall emissions from all sectors for both VOCs and NO_x show a total decrease from 2017 to 2033. The largest decreases for both pollutants come from the on-road and non-road mobile emissions sectors. Sections 2-10 provide more detail on DAQ's estimation methodology and emissions projections for each sector analyzed.

Table 1-1. Summer Weekday VOC Emissions Projections (tpd) for All Sectors

	2017	2023	2033
Sector	**VOC**	**VOC**	**VOC**
Point Source	2.95	2.62	2.63
Nonpoint Source	64.69	67.83	71.31
Mobile- On-road	26.27	17.85	11.50
Mobile- Nonroad	28.86	27.24	27.82
Airports	1.96	2.64	3.05
Locomotives	0.07	0.05	0.04
Emission Reduction Bank	0.00	0.43	0.43
Biogenic	362.61	362.61	362.61
Total	**487.41**	**481.27**	**479.39**

Table 1-2. Summer Weekday NOx Emissions Projections (tpd) for All Sectors

	2017	2023	2033
Sector	**NO_x**	**NO_x**	**NO_x**
Point Source	12.34	11.41	11.33
Nonpoint Source	4.69	5.03	4.78
Mobile- On-road	42.20	22.22	11.13
Mobile- Nonroad	37.45	23.27	15.37
Airports	11.90	15.53	19.77
Locomotives	1.42	1.21	0.96
Emission Reduction Bank	0.00	22.23	22.23
Biogenic	2.43	2.43	2.43
Total	**112.43**	**103.33**	**88.00**

2.0 ON-ROAD MOBILE SOURCE EMISSIONS

On-road mobile sources are highway mobile sources, and include automobiles, buses and trucks traveling on local and national highway roads. DAQ ran MOVES3.0.2, the latest release of EPA's MOVES model, to develop the updated on-road mobile source emissions estimates for Clark County. DAQ ran the MOVES3.0.2 model in the inventory mode, not the emission rate mode.

2.1 MOVES INPUTS

The on-road mobile sources from MOVES3.0.2 include on-road emissions from 13 source types (Table 2-1) and four roadway types (Table 2-2). DAQ developed updated county-specific MOVES input data for the 2017 base year and for future years 2023 and 2033 with the latest information.

Table 2-1. MOVES Source Use Type

Source Type ID	MOVES Source Type Name
11	Motorcycle
21	Passenger Car
31	Passenger Truck
32	Light Commercial Truck
41	Other Buses
42	Transit Bus
43	School Bus
51	Refuse Truck
52	Single Unit Short-haul Truck
53	Single Unit Long-haul Truck
54	Motor Home
61	Combination Short-haul Truck
62	Combination Long-haul Truck

Table 2-2. Map of HPMS Road Types to MOVES Road Type

HPMS Road Type	MOVES Road Type
11: Rural Principal Arterial – Interstate	2: Rural Restricted Access
13: Rural Principal Arterial - Other	3: Rural Unrestricted Access
15: Rural Minor Arterial	
17: Rural Major Collector	
19: Rural Minor Collector	
21: Rural Local System	
23: Urban Principal Arterial – Interstate	4: Urban Restricted Access
25: Urban Principal Arterial – Other Freeways	
27: Urban Principal Arterial – Other	5: Urban Unrestricted Access
29: Urban Minor Arterial	
31: Urban Collector	
33: Urban Local System	

The key MOVES inputs included such vehicle fleet activity data as vehicle miles traveled (VMT), vehicle population by vehicle source type (or vehicle class), fleet age distribution, fuel parameters, and inspection and maintenance (I/M) programs.

2.1.1 Clark County Vehicle Classification Study

Since vehicle classification is a crucial component for developing an on-road emission inventory, DAQ completed a vehicle classification study in June 2018. The study used 2014-2016 traffic count data collected by the Nevada Department of Transportation (NDOT) and included an on-road license plate survey at selected roadway locations. DAQ matched the collected license plate numbers to vehicle identification numbers (VINs), then decoded to obtain vehicle attributes that allowed DAQ's contractor to classify cars versus light-duty trucks. The primary products of the vehicle classification study were VMT mix and temporal profiles, which DAQ incorporated into the 2017 MOVES input database. The MOVES temporal profiles included monthly, weekly, and hourly traffic profiles.

2.1.1.1 VMT Mix Profiles

Figure 2-1 shows the VMT mix profiles from the study by MOVES road type. Rural Restricted Access (Road Type 2) had the highest amount of heavy-duty VMT (24%), which decreases from left to right in the figure: from Road Type 2 to Rural Unrestricted Access (Road Type 3) to Urban Restricted Access (Road Type 4) to Urban Unrestricted (Road Type 5).

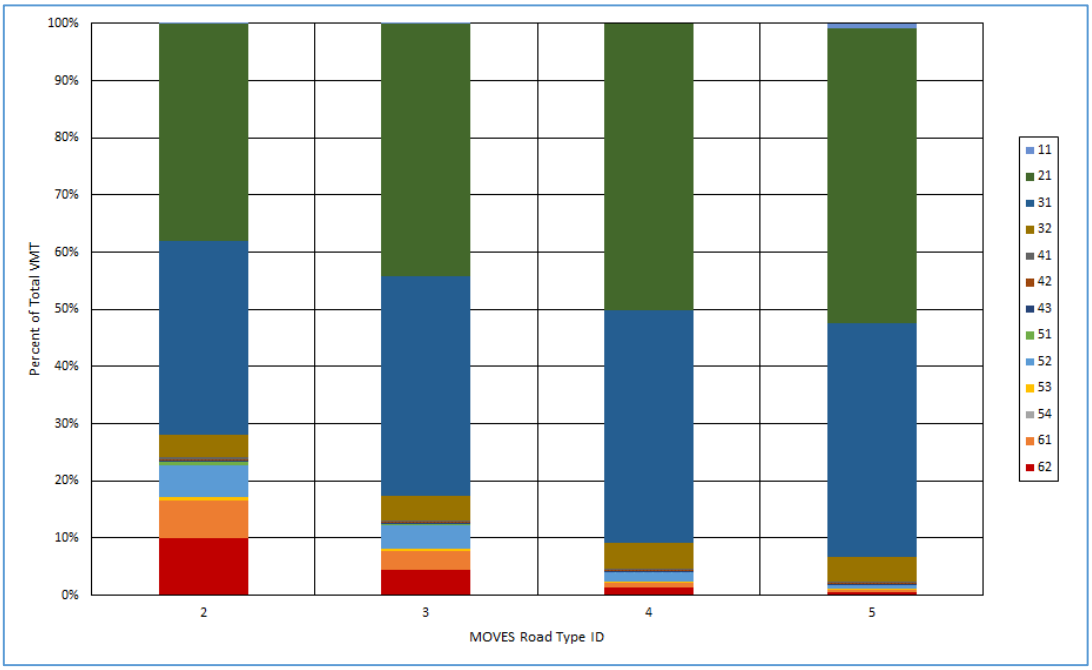

Figure 2-1. Summary of the VMT mix on each MOVES road type.

2.1.1.2 Monthly Traffic Profiles

Figure 2-2 displays the monthly VMT profiles for MOVES. The MOVES model distributes annual VMT to monthly totals using the month VMT fractions shown in Figure 2-2. Clark County's monthly variation does not indicate a strong influence of season on VMT. These monthly variations are based on the NDOT traffic counts during 2014-2016. NDOT operates continuous traffic counters throughout the year.

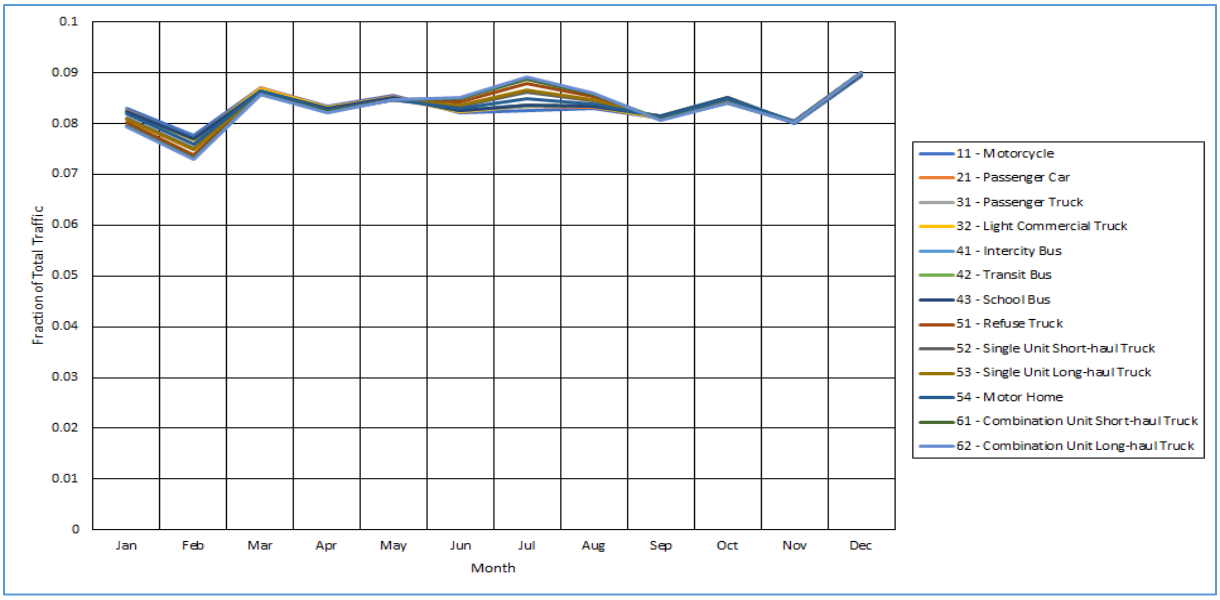

Figure 2-2. MOVES Month VMT Fractions for Clark County, NV.

2.1.1.3 Weekly Traffic Profiles

The day-of-week profiles in MOVES apportion weekly VMT to two periods of the week: "weekday," consisting of 5 days, and "weekend," consisting of 2 days. Figure 2-3 shows a sample of the profiles for passenger cars. The ratio of weekday to weekend VMT grows from left to right, moving from Rural (Road Types 2 and 3) to Urban (Road Types 4 and 5). This pattern of higher weekday VMT on urban roads and unrestricted roads was generally true for all the source types.

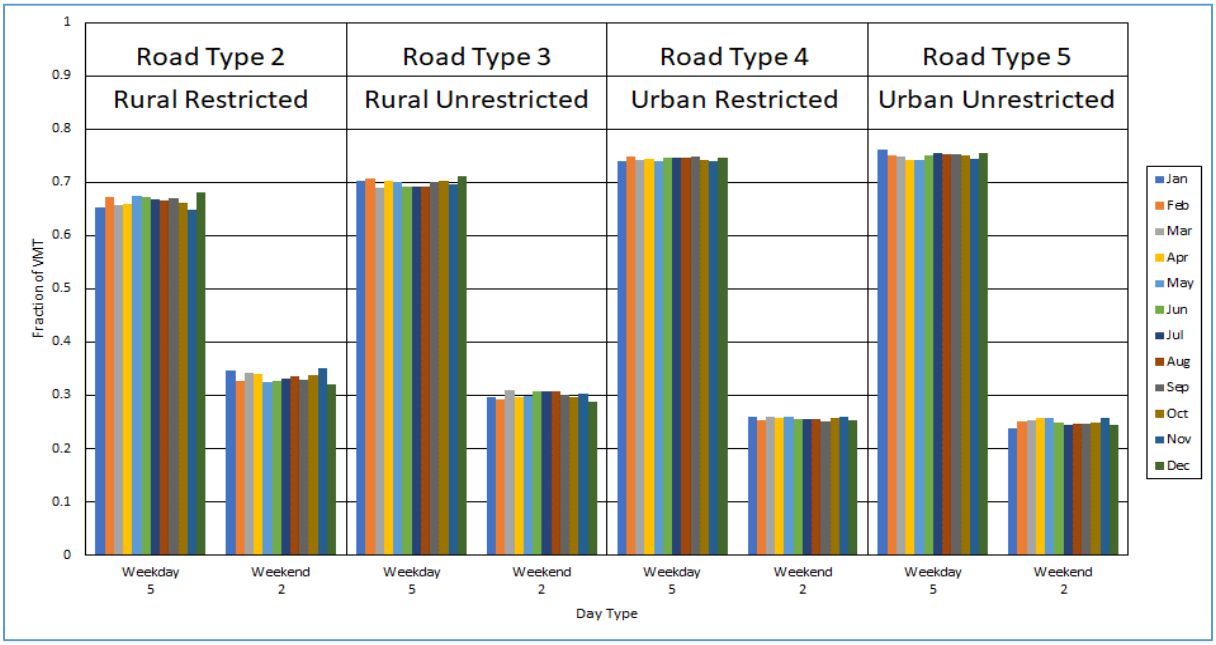

Figure 2-3. Sample MOVES Day VMT Fractions (Passenger Cars).

2.1.1.4 Hourly Traffic Profiles

Figure 2-4 shows sample MOVES hour VMT fractions for passenger cars traveling on weekdays (solid line series) and weekends (broken line series) in Clark County for each of the four MOVES road types. On weekdays, the two Urban Road Types—4 (grey) and 5 (yellow)—have prominent morning peaks in the VMT fractions. Weekend profiles on all road types reach their high point midday, i.e., between the hours of about noon to 4 p.m.

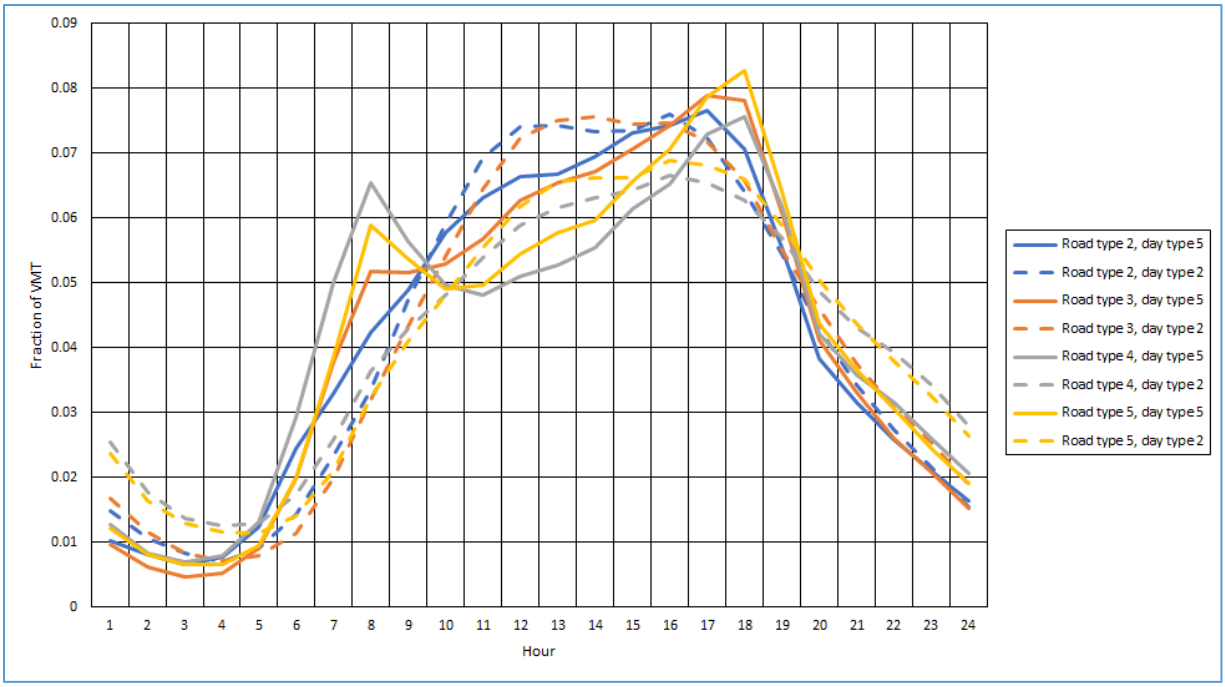

Figure 2-4. Sample MOVES Hour VMT Fractions (Passenger Cars).

2.1.2 Other MOVES Inputs

Activity data for each vehicle type, such as VMT and vehicle population, are important inputs for MOVES. VMT data for the base year (2017) inventory are derived from NDOT's 2017 annual Highway Performance Monitoring System (HPMS) reports. Table 2.5-1 shows Clark County 2017 Annual VMTs by function class from NDOT. The MOVES model requires annual or daily VMT by vehicle type; using the VMT mix information developed from the Clark County Vehicle Classification Study (Section 2.1.1), DAQ generated annual VMTs for each vehicle source type for the entire county.

For urban road types, VMTs for 2023 and 2033 were projected from 2017 using growth factors from the latest forecasts of Regional Transportation Commission of Southern Nevada (RTC) travel demand modeling. For rural road types, a linear regression projection from historical NDOT HPMS reports were used to project VMT. Table 2-3 lists annual VMT by function and Table 2-4 lists annual VMT by source type for the two modeling years.

Table 2-3. Clark County Annual VMT by Function Class

Function Class	2017 AVMT
Rural Interstate	934,039,709
Rural Other Principal Arterial	446,934,653
Rural Minor Arterial	16,245,785
Rural Major Collector	90,070,703
Rural Minor Collector	20,764,397
Rural Local	76,177,938
Urban Interstate	3,222,088,929
Urban Other Freeways and Expressways	1,509,145,790
Urban Other Principal Arterial	2,098,958,489
Urban Minor Arterial	4,028,876,472
Urban Collector	1,676,166,304
Urban Local	4,193,911,528
Annual Total	**18,313,380,697**

Table 2-4. Clark County Annual VMT by Vehicle Type

Source Type ID	Source Type Name	2017	2023	2033
11	Motorcycle	106,386,954	121,429,621	135,206,395
21	Passenger Car	9,208,010,383	10,509,984,303	11,702,392,548
31	Passenger Truck	7,407,161,693	8,454,503,186	9,413,707,217
32	Light Commercial Truck	792,674,327	904,755,141	1,007,403,961
41	Other Buses	58,489,698	65,977,421	63,842,329
42	Transit Bus	28,032,592	30,496,138	42,797,335
43	School Bus	23,000,000	28,534,722	32,551,408
51	Refuse Truck	14,183,328	16,188,791	18,025,487
52	Single Unit Short-haul Truck	229,675,451	262,150,593	291,892,838
53	Single Unit Long-haul Truck	20,871,686	23,822,855	26,525,673
54	Motor Home	1,933,403	2,206,778	2,457,147
61	Combination Short-haul Truck	170,417,334	194,513,628	216,582,135
62	Combination Long-haul Truck	252,543,847	288,252,484	320,956,114
Total:		**18,313,380,695**	**20,902,815,661**	**23,274,340,586**

DAQ derived the vehicle type population data for the entire County primarily from the DMV's vehicle registration database. Adjustments were made for transit buses based on data obtained from the RTC, and for school bus populations based on reports from the online magazine *schoolbus FLEET* (McMahon 2017). Vehicle population estimates for combination short-haul and long-haul trucks were based on MOVES3's default database. DAQ projected the vehicle populations by source type from 2017 to 2023 and 2033 using surrogates such as human population for the light duty vehicles, and VMTs for heavy duty trucks. Table 2-5 shows the Clark County vehicle population ("VPOP") data used in the modeling effort.

Table 2-5. Clark County Vehicle Population

Source Type ID	Source Type Name	2017	2023	2033
11	Motorcycle	42,492	46,452	52,992
21	Passenger Car	714,907	781,537	884,595
31	Passenger Truck	557,168	609,096	690,542
32	Light Commercial Truck	59,625	65,182	85,626
41	Other Buses	374	408	466
42	Transit Bus	797	856	1,046
43	School Bus	1,957	2,139	2,441
51	Refuse Truck	632	722	803
52	Single Unit Short-haul Truck	16,395	18,713	20,836
53	Single Unit Long-haul Truck	1,160	1,324	1,475
54	Motor Home	910	1,039	1,157
61	Combination Short-haul Truck	4,511	5,149	5,733
62	Combination Long-haul Truck	7,254	8,280	9,219
Total:		**1,408,182**	**1,540,897**	**1,756,931**

MOVES3 also requires input from hoteling activity, which refers to the hours spent idling by drivers of diesel long-haul combination trucks during mandatory rest periods. MOVES accounts for idling and auxiliary power unit (APU) use as separate emission processes, in addition to truck operation on roadways. Since no local specific hoteling hours were available, DAQ based hoteling hours on MOVES3 default values.

Ambient temperature and humidity data are based on the meteorological data collected at McCarran International Airport (LAS) in 2017. Table 2-6 presents the average hourly temperature and humidity data used in the MOVES database for the month of July of 2017.

Table 2-6. Average Hourly Temperature and Humidity at McCarran International Airport for July 2017

Hour	Temperature (F)	Humidity (%)
1	90.7	25.7
2	89.4	26.8
3	88.3	28.0
4	87.0	29.7
5	86.1	31.1
6	87.5	30.0
7	90.3	27.7
8	92.3	28.5
9	94.9	25.5
10	97.3	23.9
11	99.6	22.1
12	101.7	19.5
13	103.1	18.4
14	103.7	17.9
15	104.3	16.4
16	104.1	16.5
17	104.1	16.3
18	102.8	16.6
19	100.8	18.1
20	98.8	19.9
21	96.9	21.3
22	95.2	22.1
23	93.5	23.4
24	91.9	25.6

The Nevada Department of Motor Vehicles (DMV) provided vehicle registration data for Clark County by model year and vehicle type, from which DAQ generated the vehicle population and vehicle age distribution inputs. The age distribution for 2017 was based on the vehicle registration data from DMV for light-duty vehicle types; age distributions for heavy-duty vehicle types were exported from the MOVES3 default database. However, DAQ found a better source of data for age distribution which is a national project conducted by the Coordinated Research Council (CRC). The project performed vehicle VIN decoding of 2017 county-specific registration data from HIS Markit. EPA used the age distributions derived from the VIN-decoding project in the 2016 modeling platform and 2017 NEI development. EPA purchased the county-specific data from IHS for the entire U.S. DAQ believes that the age distributions in the 2017 NEI are more robust; therefore, DAQ used this data in Clark County's on-road inventory for 2017.

EPA recently developed an age distribution projection tool for the 2016 v.1 modeling platform that includes a new method to ensure the dip in light-duty vehicle sales during the 2008–09 recession is reflected for the same model years at a future time. In other words, the tool adjusts the age distributions of light-duty source types from the base year to future years. DAQ used this new

age-distribution projection tool to adjust the light-duty source types from the base year of 2017 to the future years of 2023 and 2033. The future-year age distributions for heavy-duty source types were kept the same as those in the base year of 2017, consistent with the assumption used in the 2016 v.1 modeling platform.

CRC also sponsored a number of projects aimed at improving the on-road portion of the NEI. Vehicle speed distribution is a crucial component for on-road emission inventories. For the Clark County 2017 MOVES database, the average vehicle speed distributions from 16 MOVES speed bins for each vehicle type are based on the CRC-sponsored project A-100, which used StreetLight Vehicle Telematics Data. DAQ used the same speed distributions for the future years of 2023 and 2033 consistent with the assumption used in the 2016 v.1 modeling platform as well as 2017 NEI.

DAQ also used fuel parameters from the MOVES3 default database. Both gasoline and diesel sulfur levels are required to meet EPA requirements for low sulfur content as part of the Tier 2 standard (before 2017) or the Tier 3 standard (after 2017). Nevada caps the fuel Reid vapor pressure in Clark County at 9.0 pounds per square inch (psi), with a 1.0-psi waiver for ethanol-blended fuels.

Information regarding vehicle I/M programs is another important input for the MOVES model. In the Las Vegas Valley, the state I/M program requires an annual two-speed idle test for 1995 and older vehicles, and on-board diagnostics checks (exhaust and evaporative) for 1996 and newer vehicles. The I/M program exempts a new vehicle from emissions test for the first 2 years in the past. During 2021 legislative session, Nevada Bill AB 349 changed the I/M grace period from 2 years to 3 years. DAQ incorporated this information into MOVES modeling using a 2-year grace period for 2017 and 3-year grace period for 2023 and 2033.

2.2 ON-ROAD MOBILE EMISSIONS ESTIMATES

Table 2-7 shows Clark County's summer weekday emissions estimates for 2017, 2022 and 2033. DAQ ran the model only for the month of July to represent typical summertime weekday on-road NO_x and VOC emissions.

Over the second maintenance period, emissions for both ozone precursors significantly decrease due to fleet turnover with the implementation of stringent emissions control limits such as Tier 3 standards, which phase-in starting in 2017.

Table 2-7. Summer Weekday On-road Mobile Emissions Projections (tpd)

Pollutant	2017	2023	2033
VOC	26.27	17.85	11.50
NO_x	42.20	22.22	11.13

3.0 NONROAD SOURCE EMISSIONS

Nonroad mobile equipment encompasses a wide variety of equipment types that either move under their own power or can be moved from site to site. DAQ generated nonroad mobile emissions inventories for 2017, 2023 and 2033 using the nonroad module of the latest MOVES model, MOVES3.0.2, released in September 2021.

The nonroad module of MOVES includes both emissions factors and default county-level population and activity data. The model estimates emissions and can be post-processed to generate emission factors. It includes more than 80 basic and 260 specific types of nonroad equipment, although it does not include commercial marine, locomotive, and aircraft emissions.

MOVES3 incorporates default estimates, variables, and factors for calculations. All data are stored in MariaDB database tables and can be changed by the user if data more appropriate to the local area are available. However, DAQ used MOVES3's default input database to estimate nonroad NO_x and VOC emissions for 2017, 2023 and 2033. The only exception is the meteorological input which is based on the data collected at McCarran International Airport as shown in Table 2-6.

Table 3-1 shows that VOC emissions for nonroad mobile sources remain relatively steady over the maintenance period, with just over a 1 tpd decrease from 2017-2033. NO_x emissions decrease by 60% over the second maintenance period with the year 2033 tpd emissions estimated at less than half of 2017 emissions.

Table 3-1. Summer Weekday Nonroad Emissions Projections (tpd)

Pollutant	2017	2023	2033
VOC	28.86	27.24	27.82
NO_x	37.45	23.27	15.37

4.0 POINT SOURCE EMISSIONS

4.1 PROJECTION METHODOLOGY

4.1.1 Basic Approach

Point sources are large, stationary sources of emissions. Examples of point sources include power plants, industrial boilers, and cement plants. EPA's threshold for including a point source in the maintenance inventory is a potential to emit 100 tons per year or more of NO_x or VOCs (40 CFR Part 51.50 Type B sources). DAQ adopted a lower threshold by including all Title V stationary sources, as well as all minor sources that had the potential to emit at least 10 tons of VOCs or 25 tons of NO_x per year in 2017.

Stationary sources in Clark County submit annual emission inventory reports based on actual emissions at their facilities. The stationary sources develop these inventories from data collected by direct on-site measurements or calculated emissions using EPA emission factors and activities data.

The DAQ used Source Classification Code (SCC) level emissions estimates from the 2017 NEI as the starting point for estimating future emissions. For point sources, an SCC is an eight-digit process-level code that describes the equipment, operation, or practice that is emitting pollutants. The DAQ adjusted the 2017 NEI emissions for each SCC using SCC-specific Growth Adjustment Factors (GAFs) calculated from EPA's 2016 v.1 Emissions Inventory Data (fh values) in the file "all_2011v63_2014v71_2016v1" for 2016, 2023 and 2028." For example, for a given SCC code, DAQ produced two annual GAFs as follows:

2023 Growth Adjustment Factor (GAF) Formula

$$\frac{[(2023 emissions - 2016 emissions)/2016 emissions]}{7\ years}$$

2028 Growth Adjustment Factor (GAF) Formula

$$\frac{[(2028 emissions - 2023 emissions)/2023 emissions]}{5\ years}$$

DAQ adjusted these factors to project future emissions as follows:

2023 Projected Emissions (PE) (tpy)

$$= 2017\ NEI\ (tpy) + [(2017\ NEI(tpy) * 2023\ GAF * 6\ years)]$$

$$\textbf{2033 Projected Emissions (tpy)} = 2023\ PE\ (tpy) + [(2023\ PE\ (tpy) * 2028\ GAF * 10\ years)]$$

DAQ then adjusted yearly emissions to summer tpd emissions using adjustment factors developed from EPA and local activity information for the 2011 Maintenance Plan (DAQEM 2011) and for 2018/2020 MVEB Updates (DAQ 2018 and DES 2020) as follows:

$$\textbf{2023 Projected Summer Weekday Emissions (tpd)} = \left[\frac{2023\ PE\ tpy}{365}\right] * [\%summer/25\%]$$

In developing SCC-specific GAFs, DAQ applied the following hierarchy:

1. Nevada-specific, SCC-specific GAFs were used when available. Information to develop the GAFs were pulled from the "all_2011v63_2014v71_2016v1" dataset available on the 2016v.1 modeling platform. DAQ used Nevada level data because county level summary data is available only at the sector level; individual SCC information at the county level is not available in the modeling platform data. DAQ sorted the data by State, and then created a subset of SCC data for Nevada. Using the Nevada subset, DAQ calculated GAFs using the formulas above;

2. If Nevada-specific SCC information was not in the subset for a given SCC, then an SCC GAF was developed from the national data for all states in the original dataset. DAQ used the maximum adjustment factor (collectively considering both the 2023 and 2028 GAFs) from national data to produce a conservative estimate unless the maximum was a clear outlier in the dataset (a single value that is notably higher than other values in the dataset). In this case, DAQ computed an arithmetic mean GAF from the 2016 to 2023 data and an arithmetic mean GAF from the 2023 to 2028 data by summing the data points and dividing by the total number of data points.

3. If a national SCC value was not available, then DAQ applied a Clark County-specific GAF developed for the entire sector (*e.g.,* the ptnonipm category) from the file "all_2011v63_2014v71_county_summary_09-Oct-2019", unless the emissions inventory entry was a low emissions source ($\leq$ 0.01 tpd), in which case DAQ assumed no growth in the emissions and assigned a default value for the GAF of 0.

4.1.2 Electric Utility Generation Units (EGUs) Point Sources

The 2016v.1 modeling platform houses separate data for EGUs that EPA developed using EPA's Integrated Power Sector Modeling (IPM) and the Eastern Regional Technical Advisory Committee (ERTAC) EGU Projection Tool. Using IPM, in the modeling platform, EPA projected emissions for 2023 and 2030; while using ERTAC, EPA projected emissions for 2023 and 2028.

In considering appropriate GAFs for EGUs, DAQ computed GAFs using the 2016v.1 emissions modeling platform as described in the previous section, but DAQ also developed GAFs using the IPM and ERTAC datasets (from "egu_2016_2023_NEEDS_NEI_ERTAC_xref_13June2019"). The IPM and/or ERTAC datasets produce preferred GAFs over the 2016v.1 modeling platform GAFs, because these modeling platforms are specifically refined for the EGU source category. "Emission projections for EGUs do not tend to follow a simple growth path from historical

emission data. The composition and behavior of the generating fleet, and resulting power sector emission patterns across facilities, states, and regions, vary substantially over time based on changing economic conditions as well as changes in fuel markets and regulatory requirements" (EPA 2017). The IPM and ERTAC models take these kinds of factors into account and offer a more refined analysis of future emissions than may be available in the 2016v.1 modeling platform. Accordingly, when available, DAQ applied the higher of the IPM or ERTAC GAFs over the 2016 v.1 modeling platform GAFs, even if the IPM/ERTAC are lower than the 2016v.1 modeling platform GAFs. DAQ used the 2016 v.1 modeling platform GAF, produced using the protocols above, when an IPM/ERTAC value was not available, or when the IPM/ERTAC appeared erroneous (e.g., emissions in a given year are grossly disproportionate to other years.)

4.2 POINT SOURCE VOC EMISSION PROJECTIONS

Point sources collectively comprised only 0.6% of the 2017 VOC NEI. DAQ projects that VOC emissions (tpy) will decline by approximately 11% from 2.95 tpd VOC in 2017 to 2.63 tpy VOC in 2023 and then remain relatively steady through 2033. This, however, represents an overall small change in emissions on a ton per day basis. Table 4-1 summarizes VOC emission changes over the projection period. The majority of both emissions increases and decreases are attributable to emission changes at power generating units including the shutdown of Reid-Gardner Generating Station.

Specifically, SCCs 20300101 (generator) and 10300603 (boiler) have the largest number of facilities in the VOC Point Source emissions inventory. SCC 10300603 also collectively represent the largest source of emissions increases (0.009 tpd VOC) in the 2033 emissions projection. Facilities reporting emissions under SCC 20100201 (turbines), the third largest category in the inventory, collectively produced the largest emissions decrease (-0.223 tpd VOC) by 2033. VOC emission projections for each point source in the emissions inventory are contained in Table 10-1. Table 4-1 summarizes the projected changes over the maintenance period.

Table 4-1. Total Point Source Summer Weekday VOC Emissions Projections (tpd)

Sector	2017	2023	2033
Point Source VOC Emissions (tpd)	2.95	2.62	2.63
Total Emission Changes for Estimation Period (tpd)		-0.33	0.01
Total Emissions Reductions (tpd) 2017-2033			-0.32

4.3 POINT SOURCE NO_X EMISSIONS PROJECTION

Point sources collectively comprised only 11% of the 2017 NO_x NEI. DAQ projects that NO_x emissions will decline by approximately 8% from 12.34 tpd VOC in 2017 to 11.33 tpy VOC by 2033. Table 4-2 summarizes NO_x emission changes over the projection period. Like VOC emissions, the majority of both emissions increases and decreases are attributable to emission changes at power generating units including the shutdown of Reid-Gardner Generating Station.

Table 4-2. Total Point Source Summer Weekday NO_x Emission Projections (tpd)

Sector	2017	2023	2033
Point Source NO_x Emissions (tpd)	12.34	11.41	11.33
Total Emission Reductions for Estimation Period(tpd)		-0.93	-0.08
Total Emissions Reductions (tpd) 2017-2033			-1.01

Specifically, SCCs 20300101 (generators) and 10300603 (boiler) have the largest number of facilities in the Point Source emissions inventory. SCC 20100201 (turbines) facilities collectively represent the largest source of emissions in the 2017 NEI and the largest emissions increases (0.1187 tpd NO_x) in the 2033 emissions projection. The shutdown of Reid-Gardner (SCC 10100101) produced the largest single source NO_x emissions reduction for the period 2017-2033, while facilities reporting emissions under SCC 20300203 (turbines) collectively produced the second largest emissions decrease in the 2033 projected inventory (-0.2321 tpd NO_x). NO_x emission projections for each point source in the emissions inventory are contained in Table 10-2 in Section 10.

5.0 NONPOINT SOURCE EMISSIONS

5.1 PROJECTION METHODOLOGY

The DAQ included emissions from small minor stationary sources and area sources in the nonpoint data category. Non-point sources typically include such emissions sources as residential combustion, agricultural burning, industrial solvents and graphic arts, and degreasing operations.

EPA uses a ten-digit SCC to identify nonpoint source emissions and DAQ used these codes to identify nonpoint sources in 2017 NEI. DAQ then applied the same growth factor adjustment protocols for each nonpoint source SCC category as applied to the point source data (See Section 4.1) with two exceptions: 1) DAQ applied a population growth factor to SCC 2104006000 Residential Natural Gas; 2) DAQ further refined the summer weekday emission estimates as outlined in Section 5.1.4.

The 2016 v.1 modeling platform used a 0-growth factor for Residential Natural Gas for both the 2016-2023 and 2024-2028 periods. New residential homes often use natural gas as a heating source and so a no growth assumption did not appear to properly represent the potential growth in emissions from this SCC category. Accordingly, DAQ applied growth factors computed from population projections instead of the 2016 v.1 modeling platform values (UNLV 2020)

In the 2011 Maintenance Plan, DAQ omitted a number of categories from the plan after finding that the categories qualified as insignificant sources (DAQEM 2011). For the second maintenance plan, DAQ re-evaluated these exclusions for residential wood combustion, livestock waste (SCC 2805002000) and agricultural field burning (SCC 2801500171) as discussed below. DAQ concluded that other categories continued to qualify as insignificant sources due to a lack of emissions in the 2017 NEI. These categories are listed in Table 5-1.

Table 5-1. List of Insignificant Activities

- dental preparation and use
- drum and barrel reclamation
- wood combustion industrial/commercial/institutional
- hospital sterilization
- Lamp (fluorescent) recycling
- lamp breakage
- swimming pools
- general laboratory activities
- fertilizer application
- animal husbandry
- agricultural tiling
- grain elevators
- cremation, human and animal
- chrome plating
- cotton ginning
- anthracite coal

5.1.1 Residential Wood Combustion

In general, emissions from residential wood burning (RWC) are inversely proportional to the temperature in the region. Clark County generally experiences higher summer day temperatures than other regions of the country. In the 2011 Maintenance Plan, DAQ assumed that residential wood burning was an insignificant emissions source during a summer weekday and did not include emissions from this category in the nonpoint source sector estimates. The DAQ re-evaluated that conclusion based on the 2017 NEI data and heating degree day information from the National Oceanic and Atmospheric Administration (NOAA) (NOAA 2017). Based on this information, DAQ reconfirmed that no heating degrees days occurred during the 2017 summer months and 0% of the annual emissions should be allocated to summer weekday emissions.

5.1.2 Agriculture

Emissions from livestock waste (SCC 2805002000) and agricultural field burning (SCC 2801500171) are comparatively less important categories for NO_x and VOC emissions in Clark County. In the 2011 Maintenance Plan, DAQ determined that the category was insignificant and did not include emissions in the attainment year or maintenance year emissions inventory.

Current 2017 NEI data for livestock waste show approximately 12 tons of VOC emissions annually from livestock waste. While still a relatively small source of emissions, DAQ included this SCC in the second maintenance demonstration, with the exception of SCCs 2805009100 (chicken confinement) and 2805010100 (turkey confinement) which showed no emissions in the 2017 NEI.

DAQ computed Nevada-specific GAFs for the livestock waste sector from the 2016 v.1 platform which showed little to no growth in emissions in this sector. These GAFs are consistent with the U.S. Department of Agriculture's (USDA's) recent 2030 projections for U.S. animal production which shows a relatively flat growth line in beef and pork, and a small increase in broilers (USDA 2030).

For agricultural burning, the 2017 NEI shows 0.183 tpy NO_x and 0.604 tpy of VOC. Most agricultural burning occurs in the spring to prepare lands for planting. Given the very low emissions levels, and this seasonal timing of emissions, DAQ concluded that agricultural burning continues as an insignificant source of emissions and did not include this category in the second maintenance plan inventories.

5.1.3 Fuel Combustion Sources

It is not uncommon for nonpoint source fuel combustion sources to include emissions from point source fuel combustion. In the 2011 Maintenance Plan, DAQ identified eight-digit SCC codes for point sources that overlap with ten-digit SCC codes for nonpoint sources.

Following the approach used for the 2011 Maintenance Plan, DAQ corrected the 2017 NEI for double counting of emissions by subtracting the total amount of point source emissions from the eight-digit SCC categories from emissions in the nonpoint source ten-digit SCC category shown in Table 5-5. Where the difference yielded a negative value, DAQ set the nonpoint source emissions to zero and assumed all the emissions are included in the point source category.

Table 5-2. Point and Nonpoint Source Emissions Overlap

Nonpoint Source SCC	Point Source SCC
2102006000	10200602 10200603 20200201 20200202 30500257 30501520 30500242 30501604
2103006000	10300602 10300603 10500206 20300202 20300203
2102004000	20200101 20200102 20200104 30500208
2103004000	20300101
2102007000	20201001
2102002000	30504033 30501604
2401020000	40201901
2401030000	40201399
2630000000	50100799

5.1.4 Temporal Distribution of Emissions

To adjust emissions from annual to summer weekday (tpd) emissions, DAQ reviewed the summer proportions applied to the nonpoint source inventory in the 2011 Maintenance Plan. In the 2011 Maintenance Plan, DAQ based some summer proportions on data from the U.S. Energy Information Administration (EIA), while other data were based on EPA's Modeling Clearinghouse Temporal Allocation guidance. Where the 2011 Maintenance Plan relied on data from the U.S. Energy Information Administration, DAQ updated temporal allocations for the second maintenance period by computing an average from EIA 2015-2019 seasonal data. In some cases, DAQ found other data sources to update the weekday allocation. Table 10-3 contains a table of summer weekday distributions and lists the data source used to compute the summer distribution in the "Data Source" column. For example, for the Storage and Transportation of Airport Aviation Gasoline, DAQ used airline fuel consumption data available from the Bureau of Transportation Statistics.

In the 2011 Maintenance Plan, DAQ used the U.S. Census Bureau *Current Industrial Reports* data to compute the temporal allocation for the Architectural Coating category. The U.S. Census Bureau discontinued collection of data for the *Current Industrial Report*s in 2011. DAQ was

unable to locate another source of data so was not able to update the basis for the temporal projection for this category. DAQ, therefore, continued to rely on the previous values calculated for the 2011 Maintenance Plan.

Other Sectors for which DAQ continued to rely on the 2011 Maintenance Plan temporal allocation are identified in Table 10-3. For categories for which DAQ could not locate specific temporal data through either new data sources or the 2011 Maintenance Plan, DAQ assigned a default temporal value of 25%, except for residential grilling. DAQ assigned a default temporal value of 75% to this category since residential grilling is more likely to occur during summer months.

For the 2011 Maintenance Plan, DAQ undertook an extensive local data collection effort and computed the percentage of activity occurring during the summer work weekdays from this information. DAQ retained these values for the second maintenance plan. These values are also listed in the last column of Table 10-3.

DAQ refined the ton per day emissions to reflect the weekday proportion using the equation below.

$$\textbf{Refined 2023 Projected Summer Weekday Emissions (tpd)} = \frac{\left[\left[\frac{2023\ PE\ tpy}{365}\right] * \left[\%\frac{summer}{25}\right] * [7\ days] * [\%weekday]\right]}{5\ days}$$

5.2 NONPOINT VOC EMISSIONS PROJECTIONS

Nonpoint sources collectively comprise only 13% of the 2017 VOC NEI. The single largest source of VOC nonpoint source emissions is the Architectural Surface Coating (SCC 2401001000) in the solvent non-industrial surface coating sector, while the largest projected emissions increase comes from Household Products in the Consumer and Commercial Solvent Use sector (SCC 2460200000). The 2016 v.1 GAFs produced a 26% growth rate for this sector from 2017-2033, which is higher than the population growth rate for the County over this same period (UNLV 2020).

DAQ estimates that total summer weekday nonpoint emissions will increase to just over 71 tpd VOC by 2033. This represents an increase of 11% or a total of 6.62 tpd additional emissions. Table 6.2-1 provides a summary of the summer weekday VOC emissions changes (tpd).

Table 5-3. Total Nonpoint Source Summer Weekday VOC Emissions Projections (tpd)

Sector	2017	2023	2033
Nonpoint Source VOC Emissions (tpd)	64.69	67.83	71.31
Total Emission Increases for Estimation Period(tpd)		3.14	3.48
Total Emissions Increase (tpd) 2017-2033			6.62

DAQ removed a number of SCC categories from the emissions projections because VOC emissions projections predicted 0 tpd emissions from the category. This occurred for one of three reasons: 1) the 2017 NEI posted no annual emissions for the category, 2) no emissions occur during

the summer (discussed in Section 6.1.1), or 3) emissions adjusted to 0 tpd after accounting for double counting with point source emissions (discussed in Section 5.1.3). Table 10-4 lists categories excluded from the future emissions projections. Table 10-5 includes the future emissions projections for each remaining SCC.

5.3 NONPOINT NO_X EMISSIONS PROJECTION

Nonpoint sources collectively comprise only 4% of the 2017 NO_x NEI. The single largest source of NO_x nonpoint source emissions is residential heating with natural gas (@ 27% of total nonpoint source emissions). DAQ estimates that total summer weekday nonpoint NO_x emission (tpd) will slightly increase and then slightly decrease over the maintenance period, with the final NO_x emissions value just 2% below the original 2017 summer weekday emissions (tpd). Table 5-4 provides a summary of the NO_x emissions changes (tpd).

Table 5-4. Total Nonpoint Source Summer Weekday NO_x Emissions Projections (tpd)

Sector	2017	2023	2033
Nonpoint Source NO_x Emissions (tpd)	4.69	5.03	4.78
Total Emission Increase for Estimation Period(tpd)		0.34	-0.25
Total Emissions Increase (tpd) 2017-2033			0.09

The largest source of nonpoint source summer weekday NO_x emissions (tpd) in Clark County is from Stationary Source Combustion Residential Natural Gas (SCC 2104006000), while the largest projected emissions increase comes from industrial distillate oil fuel combustion category. (SCC 2102004002).

DAQ removed a number of SCC categories from the emissions projections because NO_x emissions projections predicted 0 tpd emissions from the category. This occurred for one of three reasons: 1) the 2017 NEI posted no annual emissions for the category, 2) no emissions occur during the summer (discussed in Section 6.1.1), or 3) emissions adjusted to 0 tpd after accounting for double counting with point source emissions (discussed in Section 6.1.3). Table 10-6 in Section 10 lists categories excluded from the future emissions projections. Table 10-7in Section 10 includes the future emissions projections for each remaining SCC.

6.0 BIOGENIC EMISSIONS

Biogenic emissions from vegetation and soil can have a substantial impact on regional air quality. Biogenic sources include crops, lawn grass, and forests, which produce isoprene, mono-terpene, alpha-pinene, and other VOCs; soils produce a small amount of NO_x emissions as well. The predominate sources of VOC emissions in the 2017 NEI come from the biogenic sector (74%). By 2033, the proportion of the projected emissions inventory attributable to biogenic emissions increases by approximately 2%.

For the base year inventory, DAQ ran Biogenic Emissions Inventory System version 3.61 (BEIS3.61) embedded in the SMOKE 4.7 model for the month of July to generate the average ozone season day emissions for Clark County by averaging the daily emissions for the entire month.

The input data files for BEIS3.61, including gridded meteorological data, are based on the 2016 v.1 modeling platform. Another major input dataset, the Biogenic Emissions Landcover Database version 4.1 (BELD4.1) was used in the modeling platform as well as in the 2014 NEI estimates. For the 2017 NEI, however, EPA made an important update for the BEIS3.61 model which is the development of the BELD version 5 (BELD5). BELD5 includes the newer version of the Forest Inventory and Analysis, FIA version 8.0, which has a better agreement with the measured foliage biomass, which in turn can significantly improve the biogenic VOC emissions estimates. DAQ re-ran the BEIS3.61 model with the newly released BELD5 dataset to generate the biogenic emissions estimates for Clark County.

Table 6-1 shows biogenic emissions of VOC and NO_x for Clark County using BEIS3.61 with both BELD4.1 and BELD5 dataset. As shown in the Table, the biogenic VOC emission estimate with BELD5 is much lower than that with BELD4.1. DAQ assumes that biogenic emissions are the same for all years using the BELD5 values.

Notably, the emissions inventory value for biogenic emissions is higher in the 2017 emissions inventory than originally included in the 2008 attainment year under the 2011 Maintenance Plan. This discrepancy is due to the change in estimation method and since the value is held constant through the projections, the value does not affect the attainment demonstration.

Table 6-1. Total Biogenic Summer Weekday Emissions Projections (tpd)

Pollutant	BELD4.1	BELD5
NO_x	2.43	2.43
VOC	959.29	362.61

7.0 AIRPORT EMISSIONS

7.1 COMMERCIAL AVIATION

The Clark County Department of Aviation (CCDOA) oversees the operation of five commercial airports in the county:

1. McCarran International Airport
2. North Las Vegas Airport
3. Henderson Executive Airport
4. Jean Airport
5. Perkins Field (Overton Airport)

Two additional airports are proposed to open in the outer years of the maintenance period: Southern Nevada Supplemental Airport, and Sloan Regional Heliport.

CCDOA provided 2017 actual emissions for aircraft engines, APUs, and ground support equipment for each airport. CCDOA developed these emission inventories using the Federal Aviation Administration's Aviation Environmental Design Tool ("AEDT") Version 3b. CCDOA calculated the design day emissions using default meteorology in AEDT. Design day in 2017 was in October. CCDOA also developed correction factors to account for the differences in meteorology and activity between the design day and a typical summer weekday.

CCDOA projected emissions for 2023 and 2032 based on anticipated growth in passenger traffic. For purposes of the emissions inventory projections, DAQ assumes that emissions will remain steady from 2032 to 2033. DAQ also assumes that helicopter traffic will move from McCarran International Airport to the Sloan Regional Heliport by 2033, and that additional emissions will shift from McCarran International Airport to the Southern Nevada Supplemental Airport, by 2033. DAQ applied correction factors to the emission inventories for all the airports for all years using the CCDOA correction factors.

Table 7-1 summarizes emissions projections over the maintenance period for both NO_x and VOC. DAQ projections show increases in NO_x emissions and decreases in VOC emissions over the maintenance period.

Table 7-1. Commercial Airport Summer Weekday Emission Projections (tpd)

	2017		2023		2033	
Airport	**NO_x**	**VOC**	**NO_x**	**VOC**	**NO_x**	**VOC**
McCarran International Airport	10.95	1.11	12.55	1.11	11.37	0.86
North Las Vegas Airport	0.24	0.38	0.23	0.37	0.26	0.43
Henderson Executive Airport	0.21	0.21	0.22	0.22	0.27	0.26
Jean Airport	0.01	0.02	0.01	0.02	0.01	0.02
Perkins Field (Overton Airport)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Southern Nevada Supplemental Airport					4.68	0.35
Proposed Sloan Regional Heliport					0.17	<0.01
Total	**11.40**	**1.72**	**13.01**	**1.72**	**16.75**	**1.93**

7.2 FEDERAL AVIATION

7.2.1 Nellis Air Force Base

Nellis Air Force Base ("NAFB"), a federal aviation facility in Clark County, holds a Title V permit for the stationary source portion of the base. NAFB provided its 2017 and 2022 emissions to DAQ. DAQ used the 2022 estimated emissions to produce projections for 2023 and 2033 by applying a 2023 and 2028 GAF computed from Clark County average weekday emissions for the airport sector derived from the files "2028fh_county_sector_average weekday NOx_VOC; 2023fh-_county_sector_average weekday NOx_VOC; and 2016fh_county_sector_average weekday NOx_VOC." Table 7-2 shows these GAFS and projected emissions for Nellis Air Force Base

Table 7-2. Nellis Air Force Based Summer Weekday Emissions Projections (tpd)

Nellis Air Force Base	2016-2023 Annual GAF	2023-2028 Annual GAF	2017	2022	2023	2033
NO_x	0.0182	0.0262	0.50	1.97	2.03	2.53
VOC	0.0171	0.0249	0.24	0.82	0.84	1.04

7.2.2 Air Force Training Project

The Department of Air Force (DAF) is proposing to provide dedicated Contracted Close Air Support (CCAS) training for students at NAFB. The DAF proposed action involves flight and ground support operations at the North Las Vegas Airport ("NLV") and Jean Sport Aviation Center, and the aircraft would engage in training exercises in Special Use Airspace (SUA) outside of Clark County. In addition, a cargo van or large pickup truck would transport armaments between NLV and Jean airport. Contractor personnel that would be based at NLV would live locally and would engage in vehicular commutes to and from work. No construction, demolition, or renovation activity is proposed.

The proposed action includes aircraft landings & takeoffs at NLV and Jean Sport Aviation Center, touch-and-go operations at NLV, Aerospace Ground Equipment (AGE) use at both airports, employee commutes at NLV, aircraft refueling at NLV, and cargo transport of armaments between NLV and Jean airport. The proposed action is tentatively scheduled to begin on January 1, 2022, and end on December 31, 2031 (10 years). Appendix A-1 presents the methodology for estimating the emissions from the proposed DAF project. Table 7-3 shows the emissions from the project.

Table 7-3. Department of Air Force Proposed Emissions (tpd)

Air Force Training Project	Total Annual (ton/year)	Summer Weekday (tpd)	2023 (tpd)	2033 (tpd)
NO_x	127.741	0.49	0.49	0.49
VOC	20.192	0.08	0.08	0.08

7.3 AIRPORTS SUMMARY

Table 7-4 shows the summary of estimated emission projections for all the airports in the maintenance area.

Table 7-4. Airports Summer Weekday Emission Projections (tpd)

	2017		2023		2033	
	NO_x	VOC	NO_x	VOC	NO_x	VOC
Commercial Airports	11.40	1.72	13.01	1.72	16.75	1.93
Nellis Air Force Base	0.50	0.24	2.03	0.84	2.53	1.04
Air Force Training Project			0.49	0.08	0.49	0.08
Total	**11.90**	**1.96**	**15.53**	**2.64**	**19.77**	**3.05**

8.0 LOCOMOTIVE EMISSIONS

Union Pacific Railroad owns roughly 148 miles of track in Clark County. Based on local activity data collected for the 2011 Maintenance Plan, DAQ determined that emissions from locomotives are assumed to be uniform throughout the year based on gross tonnage hauled and emissions factors. DAQ used data from "2028fh_county_sector_average weekday NOx_VOC; 2023fh-_county_sector_average weekday NOx_VOC; and 2016fh_county_sector_average weekday NOx_VOC" to produce Clark County-specific GAFs for summer weekday emissions for Locomotives.

The 2011 Maintenance Plan also included predicted emissions from a high-speed passenger train service between Las Vegas and Southern California. Since that time, a contractor for the project was selected and the rail service will use zero emissions electric rail technology. Accordingly, DAQ will not add emissions to the future year projections to account for this project.

Table 8-1 displays the GAFs used to adjust the 2017 NEI and summer weekday emissions projections (tpd) for both NO_x and VOC.

Table 8-1. Total Locomotive Summer Weekday Emissions Projections (tpd)

Pollutant	2016-2023 Annual GAF	2023-2028 Annual GAF	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
NO_x	-0.02	-0.02	1.42	1.21	0.96
VOC	-0.03	-0.03	0.07	0.05	0.04

9.0 BANKED EMISSION REDUCTION CREDITS

If requested, ERCs may be granted to a source that voluntarily reduces emissions beyond required levels of control. ERCs may be sold, leased, banked for future use, or traded, in accordance with applicable regulations. Once used to offset emissions, they are permanently retired. ERCs are intended to provide an incentive for reducing emissions and to establish a framework for promoting a market-based approach to regulating air pollution. DAQ reviewed the ERCs banked in Clark County and concluded they have not changed from those submitted in the original ozone maintenance plan. Those emissions are outlined in Table 9-1.

Table 9-1. ERCs Banked in Clark County (tpd)

Pollutant	Summer Weekday Emissions (tpd)
NO_x	22.23
VOC	0.43

10.0 EMISSION PROJECTION TABLES

This section contains tables referenced in earlier sections of this Appendix.

Table 10-1. Point Source VOC Summer Weekday Emissions Projections (tpd)

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
NV Energy (Reid-Gardner)	10100101	Shutdown	Shutdown	---------	27	1.80	0.0053	0.0000	0.0000
Saguaro Power Company	10100601	0	0	2016 v.1	27	0.28	0.0008	0.0008	0.0008
Saguaro Power Company	10100602	0	0	2016 v.1	27	0.14	0.0004	0.0004	0.0004
Brady Linen Services	10200602	0.0113	0.0112	2016 v.1	25	0.88	0.0024	0.0026	0.0028
Clearwater Paper	10200602	0.0113	0.0112	2016 v.1	25	0.56	0.0015	0.0016	0.0018
Kern River (Goodsprings)	10200603	0.0068	0.0126	2016 v.1	25	0.02	0.0001	0.0001	0.0001
NV Energy (Chuck Lenzie)	10200603	0.0068	0.0126	2016 v.1	25	0.04	0.0001	0.0001	0.0001
NV Energy (Chuck Lenzie)	10200603	0.0068	0.0126	2016 v.1	25	0.04	0.0001	0.0001	0.0001
Titanium Metals Corp.	10201402	0	0	default value	25	0.17	0.0005	0.0005	0.0005
High Desert State Prison	10300502	0	0	default value	25	0.38	0.0010	0.0010	0.0010
2755 Las Vegas	10300602	0.0161	0.0012	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Aggregate Industries	10300602	0.0161	0.0012	2016 v.1	25	0.12	0.0003	0.0004	0.0004
Centennial Hills Hospital	10300602	0.0161	0.0012	2016 v.1	25	0.32	0.0009	0.0010	0.0010
Cosmopolitan Las Vegas	10300602	0.0161	0.0012	2016 v.1	25	0.90	0.0025	0.0027	0.0027
Creech AFB	10300602	0.0161	0.0012	2016 v.1	25	0.16	0.0004	0.0005	0.0005
McCarran International Airport	10300602	0.0161	0.0012	2016 v.1	25	0.80	0.0022	0.0024	0.0024
Nellis AFB	10300602	0.0161	0.0012	2016 v.1	25	0.40	0.0011	0.0012	0.0012
NV Energy (Walter Higgins)	10300602	0.0161	0.0012	2016 v.1	31	0.03	0.0001	0.0001	0.0001
Red Rock Casino Resort	10300602	0.0161	0.0012	2016 v.1	25	0.49	0.0013	0.0015	0.0015
Resorts World	10300602	0.0161	0.0012	2016 v.1	25	0.00	0.0000	0.0000	0.0000
SLS Las Vegas	10300602	0.0161	0.0012	2016 v.1	25	0.25	0.0007	0.0008	0.0008

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
South Point Hotal and Casino	10300602	0.0161	0.0012	2016 v.1	25	0.53	0.0015	0.0016	0.0016
Tronox	10300602	0.0161	0.0012	2016 v.1	25	0.04	0.0001	0.0001	0.0001
Tronox	10300602	0.0161	0.0012	2016 v.1	25	0.93	0.0025	0.0028	0.0028
Veterans Administration	10300602	0.0161	0.0012	2016 v.1	25	0.13	0.0004	0.0004	0.0004
World Market Center	10300602	0.0161	0.0012	2016 v.1	25	0.02	0.0001	0.0001	0.0001
Wynn Las Vegas	10300602	0.0161	0.0012	2016 v.1	25	1.19	0.0033	0.0036	0.0036
BKEP Materials	10300603	0.0161	0.0012	2016 v.1	25	0.72	0.0020	0.0022	0.0022
Boulder Station Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	0.15	0.0004	0.0005	0.0005
Caesars Consolidated	10300603	0.0161	0.0012	2016 v.1	25	2.00	0.0055	0.0060	0.0061
Cancun Resort	10300603	0.0161	0.0012	2016 v.1	25	0.16	0.0004	0.0005	0.0005
CCWRD Flamingo Center	10300603	0.0161	0.0012	2016 v.1	25	3.39	0.0093	0.0102	0.0103
Chemical Lime (Apex)	10300603	0.0161	0.0012	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Circus Circus Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	0.61	0.0017	0.0018	0.0019
City of Henderson Downtown	10300603	0.0161	0.0012	2016 v.1	25	0.23	0.0006	0.0007	0.0007
Clark County Downtown Campus	10300603	0.0161	0.0012	2016 v.1	25	0.71	0.0019	0.0021	0.0022
Edgewater Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	0.47	0.0013	0.0014	0.0014
Gold Coast Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	0.27	0.0007	0.0008	0.0008
Golden Nugget Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	0.15	0.0004	0.0005	0.0005
Green Valley Ranch Resort	10300603	0.0161	0.0012	2016 v.1	25	0.22	0.0006	0.0007	0.0007
Hard Rock Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	0.23	0.0006	0.0007	0.0007
Harrah's Laughlin	10300603	0.0161	0.0012	2016 v.1	25	0.23	0.0006	0.0007	0.0007
Horseshoe Club	10300603	0.0161	0.0012	2016 v.1	25	0.96	0.0026	0.0029	0.0029
JW Marriott Las Vegas	10300603	0.0161	0.0012	2016 v.1	25	0.34	0.0009	0.0010	0.0010

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Kern River (Dry Lake-Apex)	10300603	0.0161	0.0012	2016 v.1	25	0.02	0.0001	0.0001	0.0001
McCarran Rent a Car Center	10300603	0.0161	0.0012	2016 v.1	25	0.01	0.0000	0.0000	0.0000
MGM Grand/New York New York	10300603	0.0161	0.0012	2016 v.1	25	5.84	0.0160	0.0175	0.0177
Mirage/Treasure Island	10300603	0.0161	0.0012	2016 v.1	25	1.01	0.0028	0.0030	0.0031
Mountain View Hospital	10300603	0.0161	0.0012	2016 v.1	25	0.22	0.0006	0.0007	0.0007
Northwind Alladin	10300603	0.0161	0.0012	2016 v.1	25	0.21	0.0006	0.0006	0.0006
Orleans Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	0.50	0.0014	0.0015	0.0015
Palace Station Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	0.49	0.0013	0.0015	0.0015
Palms Casino Resort	10300603	0.0161	0.0012	2016 v.1	25	0.39	0.0011	0.0012	0.0012
Plasticard Locktech	10300603	0.0161	0.0012	2016 v.1	25	0.10	0.0003	0.0003	0.0003
Primm Valley Resorts	10300603	0.0161	0.0012	2016 v.1	25	0.72	0.0020	0.0022	0.0022
Progress Rail	10300603	0.0161	0.0012	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Republic Services Transfer Station	10300603	0.0161	0.0012	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Rio All Suites Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	1.58	0.0043	0.0047	0.0048
Riverside Resort	10300603	0.0161	0.0012	2016 v.1	25	0.07	0.0002	0.0002	0.0002
Sams Town Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	0.23	0.0006	0.0007	0.0007
Santa Fe Station	10300603	0.0161	0.0012	2016 v.1	25	0.67	0.0018	0.0020	0.0020
Southern Desert Correctional Center	10300603	0.0161	0.0012	2016 v.1	25	0.20	0.0005	0.0006	0.0006
St Rose Dominican Siena	10300603	0.0161	0.0012	2016 v.1	25	0.76	0.0021	0.0023	0.0023
Stratosphere Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	0.33	0.0009	0.0010	0.0010
Suncoast Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	0.23	0.0006	0.0007	0.0007
Sunset Station	10300603	0.0161	0.0012	2016 v.1	25	0.32	0.0009	0.0010	0.0010
Texas Station Casino	10300603	0.0161	0.0012	2016 v.1	25	0.40	0.0011	0.0012	0.0012

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Treasure Island	10300603	0.0161	0.0012	2016 v.1	25	0.63	0.0017	0.0019	0.0019
Tropicana Laughlin	10300603	0.0161	0.0012	2016 v.1	25	0.30	0.0008	0.0009	0.0009
University Medical Center	10300603	0.0161	0.0012	2016 v.1	25	0.41	0.0011	0.0012	0.0012
University of Nevada, Las Vegas	10300603	0.0161	0.0012	2016 v.1	25	0.74	0.0020	0.0022	0.0022
Venetian Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	3.17	0.0087	0.0095	0.0096
Westgate Las Vegas	10300603	0.0161	0.0012	2016 v.1	25	0.58	0.0016	0.0017	0.0018
NV Energy (Chuck Lenzie)	10500206	0.0161	0.0012	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Switch Communications	20022102	0	0	default value	25	0.51	0.0014	0.0014	0.0014
Aggregate Industries	20100102	0	0	2016 v.1	25	3.29	0.0090	0.0090	0.0090
Chemical Lime (Apex)	20100102	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Chemical Lime (Apex)	20100102	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Edgewater Hotel and Casino	20100102	0	0	2016 v.1	25	1.04	0.0028	0.0028	0.0028
Georgia Pacific	20100102	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	20100102	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Harrah's Laughlin	20100102	0	0	2016 v.1	25	0.01	0.0000	0.0000	0.0000
High Desert State Prison	20100102	0	0	2016 v.1	25	0.11	0.0003	0.0003	0.0003
Las Vegas Cogeneration	20100102	0	0	2016 v.1	51	0.01	0.0001	0.0001	0.0001
Las Vegas Cogeneration	20100102	0	0	2016 v.1	51	0.02	0.0001	0.0001	0.0001
Las Vegas Power Company, LLC	20100102	0	0	2016 v.1	45	0.03	0.0001	0.0001	0.0001
Las Vegas Power Company, LLC	20100102	0	0	2016 v.1	45	0.12	0.0006	0.0006	0.0006
Las Vegas Power Company, LLC	20100102	0	0	2016 v.1	45	0.15	0.0007	0.0007	0.0007
Manheim Nevada	20100102	0	0	2016 v.1	25	0.02	0.0001	0.0001	0.0001
NV Energy (Chuck Lenzie)	20100102	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000
NV Energy (Harry Allen)	20100102	0	0	2016 v.1	80	0.00	0.0000	0.0000	0.0000
NV Energy (Harry Allen)	20100102	0	0	2016 v.1	80	0.00	0.0000	0.0000	0.0000

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
NV Energy (Harry Allen)	20100102	0	0	2016 v.1	80	0.01	0.0001	0.0001	0.0001
NV Energy (Harry Allen)	20100102	0	0	2016 v.1	80	0.02	0.0002	0.0002	0.0002
Primm Valley Resorts	20100102	0	0	2016 v.1	25	0.06	0.0002	0.0002	0.0002
Riverside Resort	20100102	0	0	2016 v.1	25	0.04	0.0001	0.0001	0.0001
Saguaro Power Company	20100102	0	0	2016 v.1	27	0.01	0.0000	0.0000	0.0000
Saguaro Power Company	20100102	0	0	2016 v.1	27	0.01	0.0000	0.0000	0.0000
Saguaro Power Company	20100102	0	0	2016 v.1	27	0.05	0.0001	0.0001	0.0001
Westgate Las Vegas	20100102	0	0	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Wynn Las Vegas	20100102	0	0	2016 v.1	25	0.32	0.0009	0.0009	0.0009
El Dorado Energy	20100201	0.0357	0	2016 v.1	27	9.32	0.0276	0.0335	0.0335
El Dorado Energy	20100201	0.0357	0	2016 v.1	27	10.94	0.0324	0.0393	0.0393
Las Vegas Cogeneration	20100201	0.0357	0	2016 v.1	51	0.68	0.0038	0.0046	0.0046
Las Vegas Cogeneration	20100201	0.0357	0	2016 v.1	51	0.98	0.0055	0.0067	0.0067
Las Vegas Cogeneration	20100201	0.0357	0	2016 v.1	51	1.34	0.0075	0.0091	0.0091
Las Vegas Cogeneration	20100201	0.0357	0	2016 v.1	51	1.35	0.0075	0.0092	0.0092
Las Vegas Cogeneration	20100201	0.0357	0	2016 v.1	51	1.41	0.0079	0.0096	0.0096
Las Vegas Power Company, LLC	20100201	-0.04777	0.002315	IPM	45	10.80	0.0533	0.0380	0.0388
Las Vegas Power Company, LLC	20100201	-0.10371	0.002315	IPM	45	10.90	0.0538	0.0203	0.0207
MGM Grand/New York New York	20100201	0.0357	0	2016 v.1	25	0.85	0.0023	0.0028	0.0028
Nevada Cogeneration Assoc. #2	20100201	0.0357	0	2016 v.1	27	0.01	0.0000	0.0000	0.0000
Nevada Sun Peak Partnerships	20100201	0.0357	0	2016 v.1	37	0.06	0.0002	0.0003	0.0003
Nevada Sun Peak Partnerships	20100201	0.0357	0	2016 v.1	37	0.08	0.0003	0.0004	0.0004
Nevada Sun Peak Partnerships	20100201	0.0357	0	2016 v.1	37	0.11	0.0004	0.0005	0.0005
NV Energy (Chuck Lenzie)	20100201	-0.07107	0.000503	IPM	25	17.63	0.0483	0.0277	0.0278

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
NV Energy (Chuck Lenzie)	20100201	-0.07143	0.000503	IPM	25	18.77	0.0514	0.0294	0.0295
NV Energy (Chuck Lenzie)	20100201	-0.07823	0.000503	IPM	25	18.85	0.0516	0.0274	0.0275
NV Energy (Chuck Lenzie)	20100201	-0.07411	0.000503	IPM	25	18.95	0.0519	0.0288	0.0290
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	0.26	0.0008	0.0009	0.0009
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	0.30	0.0009	0.0011	0.0011
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	0.30	0.0009	0.0011	0.0011
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	0.32	0.0009	0.0011	0.0011
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	0.33	0.0010	0.0012	0.0012
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	0.34	0.0010	0.0012	0.0012
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	0.36	0.0011	0.0013	0.0013
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	0.39	0.0012	0.0014	0.0014
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	0.44	0.0013	0.0016	0.0016
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	0.44	0.0013	0.0016	0.0016
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	0.47	0.0014	0.0017	0.0017
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	0.52	0.0015	0.0019	0.0019
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	0.54	0.0016	0.0019	0.0019
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	1.83	0.0054	0.0066	0.0066
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	2.29	0.0068	0.0082	0.0082
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	2.44	0.0072	0.0088	0.0088
NV Energy (Clark Station)	20100201	0.0357	0	2016 v.1	27	2.53	0.0075	0.0091	0.0091
NV Energy (Harry Allen)	20100201	0.0357	0	2016 v.1	80	0.34	0.0030	0.0036	0.0036
NV Energy (Harry Allen)	20100201	0.0357	0	2016 v.1	80	0.50	0.0044	0.0053	0.0053
NV Energy (Harry Allen)	20100201	-0.01802	0	IPM	80	20.32	0.1781	0.1589	0.1589
NV Energy (Harry Allen)	20100201	-0.09116	0	IPM	80	20.98	0.1839	0.0833	0.0833
NV Energy (Silverhawk)	20100201	0.0357	0	2016 v.1	30	21.32	0.0701	0.0851	0.0851
NV Energy (Silverhawk)	20100201	0.0357	0	2016 v.1	30	22.48	0.0739	0.0897	0.0897
NV Energy (Walter Higgins)	20100201	-0.11113	0.079908	IPM	31	11.65	0.0396	0.0132	0.0227

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
NV Energy (Walter Higgins)	20100201	-0.1122	0.074901	IPM	31	12.06	0.0410	0.0134	0.0224
Saguaro Power Company	20100201	0.0357	0	2016 v.1	27	3.88	0.0115	0.0139	0.0139
Saguaro Power Company	20100201	0.0357	0	2016 v.1	27	3.88	0.0115	0.0139	0.0139
CC Landfill Energy LLC	20100801	0	0	2016 v.1	25	10.00	0.0274	0.0274	0.0274
Nevada Cogeneration Assoc. #2	20200101	0.022	0.0078	2016 v.1	27	0.01	0.0000	0.0000	0.0000
Nevada Cogeneration Assoc. #2	20200101	0.022	0.0078	2016 v.1	27	0.01	0.0000	0.0000	0.0000
Biodiesel of Las Vegas	20200102	0.0243	-0.0009	2016 v.1	25	0.04	0.0001	0.0001	0.0001
City of Las Vegas WPCF	20200102	0.0243	-0.0009	2016 v.1	25	0.07	0.0002	0.0002	0.0002
El Dorado Energy	20200102	0.0243	-0.0009	2016 v.1	27	0.01	0.0000	0.0000	0.0000
Fisher Sand and Gravel	20200102	0.0243	-0.0009	2016 v.1	25	0.84	0.0023	0.0026	0.0026
H Lima Nevada	20200102	0.0243	-0.0009	2016 v.1	25	1.92	0.0053	0.0060	0.0060
Kinder Morgan	20200102	0.0243	-0.0009	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Kurt Segler Water Reclamation	20200102	0.0243	-0.0009	2016 v.1	25	0.90	0.0025	0.0028	0.0028
Las Vegas Paving - 5th Street	20200102	0.0243	-0.0009	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Las Vegas Paving - Lone Mountain	20200102	0.0243	-0.0009	2016 v.1	25	1.69	0.0046	0.0053	0.0053
McCarran International Airport	20200102	0.0243	-0.0009	2016 v.1	25	0.14	0.0004	0.0004	0.0004
Nevada Cogeneration Assoc. #1	20200102	0.0243	-0.0009	2016 v.1	27	0.01	0.0000	0.0000	0.0000
Nevada Cogeneration Assoc. #1	20200102	0.0243	-0.0009	2016 v.1	27	0.01	0.0000	0.0000	0.0000
Nevada Cogeneration Assoc. #1	20200102	0.0243	-0.0009	2016 v.1	27	0.01	0.0000	0.0000	0.0000
Nikkiso Cryo	20200102	0.0243	-0.0009	2016 v.1	25	0.39	0.0011	0.0012	0.0012
NV Energy (Chuck Lenzie)	20200102	0.0243	-0.0009	2016 v.1	25	0.00	0.0000	0.0000	0.0000
NV Energy (Clark Station)	20200102	0.0243	-0.0009	2016 v.1	27	0.01	0.0000	0.0000	0.0000
NV Energy (Clark Station)	20200102	0.0243	-0.0009	2016 v.1	27	0.01	0.0000	0.0000	0.0000

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
NV Energy (Silverhawk)	20200102	0.0243	-0.0009	2016 v.1	30	0.00	0.0000	0.0000	0.0000
NV Energy (Silverhawk)	20200102	0.0243	-0.0009	2016 v.1	30	0.33	0.0011	0.0012	0.0012
NV Energy (Walter Higgins)	20200102	0.0243	-0.0009	2016 v.1	31	0.01	0.0000	0.0000	0.0000
Olin Chlor Alkali Products	20200102	0.0243	-0.0009	2016 v.1	25	0.29	0.0008	0.0009	0.0009
Republic DUMPCO (Apex)	20200102	0.0243	-0.0009	2016 v.1	25	5.13	0.0141	0.0161	0.0160
Service Rock Products	20200102	0.0243	-0.0009	2016 v.1	25	2.79	0.0076	0.0088	0.0087
Southern Desert Correctional Center	20200102	0.0243	-0.0009	2016 v.1	25	0.26	0.0007	0.0008	0.0008
Kern River (Goodsprings)	20200201	0.0215	0.0024	2016 v.1	25	7.50	0.0205	0.0232	0.0237
City of Las Vegas WPCF	20200202	0.0206	0.0023	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Georgia Pacific	20200202	0.0206	0.0023	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	20200202	0.0206	0.0023	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	20200202	0.0206	0.0023	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	20200202	0.0206	0.0023	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	20200202	0.0206	0.0023	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Kern River (Dry Lake-Apex)	20200202	0.0206	0.0023	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Kern River (Goodsprings)	20200253	0.0067	0.0126	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Certain Teed Gypsum	20200401	0.0265	-0.001	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Certain Teed Gypsum	20200401	0.0265	-0.001	2016 v.1	25	0.19	0.0005	0.0006	0.0006
NV Energy (Chuck Lenzie)	20201001	-0.0623	0.0036	2016 v.1	25	0.01	0.0000	0.0000	0.0000
NV Energy (Chuck Lenzie)	20201001	-0.0623	0.0036	2016 v.1	25	0.01	0.0000	0.0000	0.0000
2755 Las Vegas	20300101	0.0219	-0.0034	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Beltway Complex	20300101	0.0219	-0.0034	2016 v.1	25	0.04	0.0001	0.0001	0.0001
Berry Plastics Corporation	20300101	0.0219	-0.0034	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Blue Diamond Hill Gypsum	20300101	0.0219	-0.0034	2016 v.1	25	4.28	0.0117	0.0133	0.0129
Boulder Station Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.03	0.0001	0.0001	0.0001

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Cancun Resort	20300101	0.0219	-0.0034	2016 v.1	25	0.02	0.0001	0.0001	0.0001
CDW Logistics	20300101	0.0219	-0.0034	2016 v.1	25	0.04	0.0001	0.0001	0.0001
Centennial Hills Hospital	20300101	0.0219	-0.0034	2016 v.1	25	0.02	0.0001	0.0001	0.0001
Citibank The Lakes	20300101	0.0219	-0.0034	2016 v.1	25	0.01	0.0000	0.0000	0.0000
City of Henderson Downtown	20300101	0.0219	-0.0034	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Clark County Downtown Campus	20300101	0.0219	-0.0034	2016 v.1	25	0.11	0.0003	0.0003	0.0003
Cosmopolitan Las Vegas	20300101	0.0219	-0.0034	2016 v.1	25	0.01	0.0000	0.0000	0.0000
CTC Crushing	20300101	0.0219	-0.0034	2016 v.1	25	0.61	0.0017	0.0019	0.0018
Freeman	20300101	0.0219	-0.0034	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Gold Coast Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.06	0.0002	0.0002	0.0002
Green Valley Ranch Resort	20300101	0.0219	-0.0034	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Hard Rock Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.02	0.0001	0.0001	0.0001
JW Marriott Las Vegas	20300101	0.0219	-0.0034	2016 v.1	25	0.02	0.0001	0.0001	0.0001
Las Vegas Review Journal	20300101	0.0219	-0.0034	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Lasfuel McCarran Tank Farm	20300101	0.0219	-0.0034	2016 v.1	25	0.02	0.0001	0.0001	0.0001
MGM Grand/New York New York	20300101	0.0219	-0.0034	2016 v.1	25	0.55	0.0015	0.0017	0.0017
Mountain View Hospital	20300101	0.0219	-0.0034	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Orleans Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Palace Station Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.02	0.0001	0.0001	0.0001
Palms Casino Resort	20300101	0.0219	-0.0034	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Red Rock Casino Resort	20300101	0.0219	-0.0034	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Republic Services Transfer Station	20300101	0.0219	-0.0034	2016 v.1	25	0.44	0.0012	0.0014	0.0013
Resorts World	20300101	0.0219	-0.0034	2016 v.1	25	0.00	0.0000	0.0000	0.0000

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Rio All Suites Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.05	0.0001	0.0002	0.0002
Sams Town Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Santa Fe Station	20300101	0.0219	-0.0034	2016 v.1	25	0.01	0.0000	0.0000	0.0000
SLS Las Vegas	20300101	0.0219	-0.0034	2016 v.1	25	0.05	0.0001	0.0002	0.0002
South Point Hotal and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.03	0.0001	0.0001	0.0001
St Rose Dominican Siena	20300101	0.0219	-0.0034	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Stratosphere Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.17	0.0005	0.0005	0.0005
Suncoast Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Sunset Station	20300101	0.0219	-0.0034	2016 v.1	25	0.02	0.0001	0.0001	0.0001
Switch	20300101	0.0219	-0.0034	2016 v.1	25	0.13	0.0004	0.0004	0.0004
Terra Firma Organics	20300101	0.0219	-0.0034	2016 v.1	25	0.16	0.0004	0.0005	0.0005
Texas Station Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.02	0.0001	0.0001	0.0001
Tronox	20300101	0.0219	-0.0034	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Tronox	20300101	0.0219	-0.0034	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Tronox	20300101	0.0219	-0.0034	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Tronox	20300101	0.0219	-0.0034	2016 v.1	25	0.03	0.0001	0.0001	0.0001
University Medical Center	20300101	0.0219	-0.0034	2016 v.1	25	0.08	0.0002	0.0002	0.0002
University of Nevada, Las Vegas	20300101	0.0219	-0.0034	2016 v.1	25	0.06	0.0002	0.0002	0.0002
Venetian Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.12	0.0003	0.0004	0.0004
Verizon Business	20300101	0.0219	-0.0034	2016 v.1	25	0.02	0.0001	0.0001	0.0001
Veterans Administration	20300101	0.0219	-0.0034	2016 v.1	25	0.74	0.0020	0.0023	0.0022
Viawest	20300101	0.0219	-0.0034	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Viawest Lone Mountain Data Center	20300101	0.0219	-0.0034	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Wells Cargo Lone Mountain	20300101	0.0219	-0.0034	2016 v.1	25	0.17	0.0005	0.0005	0.0005
World Market Center	20300101	0.0219	-0.0034	2016 v.1	25	0.06	0.0002	0.0002	0.0002

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Nevada Cogeneration Assoc. #1	20300203	-0.1247		IPM	27	8.09	0.0239	0.0060	0.0060
Nevada Cogeneration Assoc. #1	20300203	-0.10344	0	IPM	27	8.14	0.0241	0.0091	0.0091
Nevada Cogeneration Assoc. #1	20300203	-0.12448	0	IPM	27	8.15	0.0241	0.0061	0.0061
Nevada Cogeneration Assoc. #2	20300203	-0.12457	0	IPM	27	8.49	0.0251	0.0063	0.0063
Nevada Cogeneration Assoc. #2	20300203	-0.12463	0	IPM	27	8.52	0.0252	0.0064	0.0064
Nevada Cogeneration Assoc. #2	20300203	-0.10092	0	IPM	27	8.55	0.0253	0.0100	0.0100
Creech AFB	20300301	0.002	0.0009	2016 v.1	25	0.84	0.0023	0.0023	0.0023
Nellis AFB	20300301	0.002	0.0009	2016 v.1	25	0.31	0.0008	0.0009	0.0009
NBC Fourth Realty	20301001	0	0	default value	25	0.16	0.0004	0.0004	0.0004
Nellis AFB	20400110	0	0	default value	25	0.53	0.0015	0.0015	0.0015
Artesian Spas	24010900	0	0	default value	25	0.66	0.0018	0.0018	0.0018
Nellis AFB	24600000	0.0042	0.0003	2016 v.1	25	6.14	0.0168	0.0172	0.0173
Tronox	30107002	0	0	2016 v.1	25	0.07	0.0002	0.0002	0.0002
Tronox	30107002	0	0	2016 v.1	25	0.33	0.0009	0.0009	0.0009
Erickson International	30190013	0	0	default value	25	0.02	0.0001	0.0001	0.0001
Titanium Metals Corp.	30301201	0	0	default value	25	0.06	0.0002	0.0002	0.0002
Titanium Metals Corp.	30301299	0	0	2016 v.1	25	2.14	0.0059	0.0059	0.0059
Aggregate Industries - Gowan	30500205	0	0	2016 v.1	25	2.98	0.0082	0.0082	0.0082
Las Vegas Paving	30500205	0	0	2016 v.1	25	2.04	0.0056	0.0056	0.0056
Las Vegas Paving - 5th Street	30500205	0	0	2016 v.1	25	5.19	0.0142	0.0142	0.0142
Las Vegas Paving - Lone Mountain	30500205	0	0	2016 v.1	25	3.32	0.0091	0.0091	0.0091
Nellis AFB	30500205	0	0	2016 v.1	25	0.12	0.0003	0.0003	0.0003

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Las Vegas Paving - 5th Street	30500206	0	0	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Wells Cargo	30500206	0	0	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Aggregate Industries	30500208	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Aggregate Industries	30500208	0	0	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Aggregate Industries	30500208	0	0	2016 v.1	25	0.02	0.0000	0.0000	0.0000
Aggregate Industries - Gowan	30500208	0	0	2016 v.1	25	0.07	0.0002	0.0002	0.0002
Las Vegas Paving	30500208	0	0	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Las Vegas Paving - Lone Mountain	30500209	0	0	default value	25	0.02	0.0001	0.0001	0.0001
Aggregate Industries - Gowan	30500212	0	0	default value	25	4.38	0.0120	0.0120	0.0120
Fisher Sand and Gravel	30500212	0	0	default value	25	0.01	0.0000	0.0000	0.0000
Fisher Sand and Gravel	30500212	0	0	default value	25	0.01	0.0000	0.0000	0.0000
Fisher Sand and Gravel	30500213	0	0	2016 v.1	25	0.23	0.0006	0.0006	0.0006
Las Vegas Paving	30500213	0	0	2016 v.1	25	0.06	0.0002	0.0002	0.0002
Las Vegas Paving - 5th Street	30500213	0	0	2016 v.1	25	2.11	0.0058	0.0058	0.0058
Las Vegas Paving - Lone Mountain	30500213	0	0	2016 v.1	25	0.08	0.0002	0.0002	0.0002
Las Vegas Paving	30500214	0	0	2016 v.1	25	0.26	0.0007	0.0007	0.0007
Las Vegas Paving - 5th Street	30500214	0	0	2016 v.1	25	0.68	0.0019	0.0019	0.0019
Fisher Sand and Gravel	30500221	0	0	default value	25	0.72	0.0020	0.0020	0.0020
Aggregate Industries	30500242	0	0	2016 v.1	25	0.02	0.0000	0.0000	0.0000
Las Vegas Paving - Blue Diamond	30500257	0	0	2016 v.1	25	4.97	0.0136	0.0136	0.0136
Wells Cargo	30500257	0	0	2016 v.1	25	8.76	0.0240	0.0240	0.0240
Fisher Sand and Gravel	30500298	0	0	2016 v.1	25	1.88	0.0052	0.0052	0.0052
Wells Cargo	30500298	0	0	2016 v.1	25	5.36	0.0147	0.0147	0.0147

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Boral Roofing	30500850	0	0	2016 v.1	25	0.01	0.0000	0.0000	0.0000
PABCO Gypsum	30501501	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000
PABCO Gypsum	30501501	0	0	2016 v.1	25	0.54	0.0015	0.0015	0.0015
Certain Teed Gypsum	30501502	0	0	2016 v.1	25	0.31	0.0008	0.0008	0.0008
Georgia Pacific	30501502	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	30501502	0	0	2016 v.1	25	0.28	0.0008	0.0008	0.0008
PABCO Gypsum	30501507	0	0	2016 v.1	25	10.96	0.0300	0.0300	0.0300
Certain Teed Gypsum	30501511	0	0	2016 v.1	25	0.10	0.0003	0.0003	0.0003
Georgia Pacific	30501511	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	30501511	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Certain Teed Gypsum	30501513	0	0	2016 v.1	25	0.29	0.0008	0.0008	0.0008
Georgia Pacific	30501513	0	0	2016 v.1	25	0.12	0.0003	0.0003	0.0003
Georgia Pacific	30501513	0	0	2016 v.1	25	0.16	0.0004	0.0004	0.0004
Georgia Pacific	30501513	0	0	2016 v.1	25	0.18	0.0005	0.0005	0.0005
Georgia Pacific	30501513	0	0	2016 v.1	25	0.19	0.0005	0.0005	0.0005
Georgia Pacific	30501513	0	0	2016 v.1	25	0.19	0.0005	0.0005	0.0005
PABCO Gypsum	30501513	0	0	2016 v.1	25	0.04	0.0001	0.0001	0.0001
PABCO Gypsum	30501513	0	0	2016 v.1	25	0.04	0.0001	0.0001	0.0001
PABCO Gypsum	30501513	0	0	2016 v.1	25	0.04	0.0001	0.0001	0.0001
PABCO Gypsum	30501513	0	0	2016 v.1	25	0.08	0.0002	0.0002	0.0002
PABCO Gypsum	30501513	0	0	2016 v.1	25	0.08	0.0002	0.0002	0.0002
PABCO Gypsum	30501513	0	0	2016 v.1	25	0.08	0.0002	0.0002	0.0002
PABCO Gypsum	30501513	0	0	2016 v.1	25	0.28	0.0008	0.0008	0.0008
PABCO Gypsum	30501513	0	0	2016 v.1	25	0.28	0.0008	0.0008	0.0008
PABCO Gypsum	30501513	0	0	2016 v.1	25	0.29	0.0008	0.0008	0.0008
PABCO Gypsum	30501513	0	0	2016 v.1	25	0.29	0.0008	0.0008	0.0008
Certain Teed Gypsum	30501520	0	0	2016 v.1	25	0.70	0.0019	0.0019	0.0019
Georgia Pacific	30501520	0	0	2016 v.1	25	19.20	0.0526	0.0526	0.0526

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
PABCO Gypsum	30501520	0	0	2016 v.1	25	0.01	0.0000	0.0000	0.0000
PABCO Gypsum	30501520	0	0	2016 v.1	25	0.01	0.0000	0.0000	0.0000
PABCO Gypsum	30501520	0	0	2016 v.1	25	0.03	0.0001	0.0001	0.0001
PABCO Gypsum	30501520	0	0	2016 v.1	25	0.04	0.0001	0.0001	0.0001
PABCO Gypsum	30501520	0	0	2016 v.1	25	0.05	0.0001	0.0001	0.0001
PABCO Gypsum	30501520	0	0	2016 v.1	25	0.28	0.0008	0.0008	0.0008
PABCO Gypsum	30501520	0	0	2016 v.1	25	0.28	0.0008	0.0008	0.0008
PABCO Gypsum	30501520	0	0	2016 v.1	25	0.28	0.0008	0.0008	0.0008
PABCO Gypsum	30501520	0	0	2016 v.1	25	0.56	0.0015	0.0015	0.0015
PABCO Gypsum	30501520	0	0	2016 v.1	25	0.56	0.0015	0.0015	0.0015
PABCO Gypsum	30501520	0	0	2016 v.1	25	0.56	0.0015	0.0015	0.0015
PABCO Gypsum	30501520	0	0	2016 v.1	25	0.57	0.0016	0.0016	0.0016
PABCO Gypsum	30501520	0	0	2016 v.1	25	0.63	0.0017	0.0017	0.0017
PABCO Gypsum	30501520	0	0	2016 v.1	25	1.62	0.0044	0.0044	0.0044
PABCO Gypsum	30501520	0	0	2016 v.1	25	2.09	0.0057	0.0057	0.0057
PABCO Gypsum	30501520	0	0	2016 v.1	25	2.36	0.0065	0.0065	0.0065
Georgia Pacific	30501599	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	30501599	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Chemical Lime (Apex)	30501604	0	0	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Chemical Lime (Apex)	30501604	0	0	2016 v.1	25	0.21	0.0006	0.0006	0.0006
Chemical Lime (Apex)	30501604	0	0	2016 v.1	25	0.56	0.0015	0.0015	0.0015
Chemical Lime (Apex)	30501604	0	0	2016 v.1	25	2.28	0.0062	0.0062	0.0062
Chemical Lime (Apex)	30501699	0	0	2016 v.1	25	3.52	0.0096	0.0096	0.0096
Republic DUMPCO (Apex)	30502503	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Republic DUMPCO (Apex)	30502503	0	0	2016 v.1	25	24.00	0.0658	0.0658	0.0658
Geneva Polymer Products	30502508	0	0	default value	25	0.05	0.0001	0.0001	0.0001
PABCO Gypsum	30502513	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
PABCO Gypsum	30502513	0	0	2016 v.1	25	21.56	0.0591	0.0591	0.0591
Aggregate Industries	30502599	0	0	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Wells Cargo Lone Mountain	30504001	0	0	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Brady Linen Services	30504033	0	0	2016 v.1	25	1.48	0.0041	0.0041	0.0041
J R Simplot Company	30504033	0	0	2016 v.1	25	0.38	0.0010	0.0010	0.0010
J R Simplot Company	30504099	0	0	2016 v.1	25	0.05	0.0001	0.0001	0.0001
Kinder Morgan	30600904	0	0	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Clearwater Paper	30790003	0.0042	0.0003	2016 v.1	25	6.93	0.0190	0.0195	0.0195
Clearwater Paper	30799998	0.0392	0.0232	2016 v.1	25	14.58	0.0399	0.0493	0.0596
Artesian Spas	30800724	0	0	default value	25	1.53	0.0042	0.0042	0.0042
Artesian Spas	30800799	0	0	2016 v.1	25	4.78	0.0131	0.0131	0.0131
LASCO Bathware	30800799	0	0	2016 v.1	25	7.22	0.0198	0.0198	0.0198
Metl Span	30800802	0	0	2016 v.1	25	2.42	0.0066	0.0066	0.0066
Univeral Urethane	30800802	0	0	2016 v.1	25	14.37	0.0394	0.0394	0.0394
Metl Span	30801005	0	0	2016 v.1	25	2.18	0.0060	0.0060	0.0060
Geneva Polymer Products	30801007	0	0	2016 v.1	25	10.83	0.0297	0.0297	0.0297
Letica Corporation	30801007	0	0	2016 v.1	25	0.53	0.0015	0.0015	0.0015
Kern River (Dry Lake-Apex)	31000203	0	0	2016 v.1	25	5.27	0.0144	0.0144	0.0144
Las Vegas Paving - 5th Street	39001089	0	0	default value	25	0.52	0.0014	0.0014	0.0014
Wynn Las Vegas	40100103	0	0	2016 v.1	25	0.24	0.0007	0.0007	0.0007
Creech AFB	40100336	0	0	default value	25	0.29	0.0008	0.0008	0.0008
Nellis AFB	40100336	0	0	default value	25	0.08	0.0002	0.0002	0.0002
Erickson International	40200101	0	0	2016 v.1	25	0.02	0.0001	0.0001	0.0001
Southern Desert Correctional Center	40200101	0	0	2016 v.1	25	0.89	0.0024	0.0024	0.0024
Yesco	40200101	0	0	2016 v.1	25	4.82	0.0132	0.0132	0.0132

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Freeman	40200102	0	0	default value	25	0.66	0.0018	0.0018	0.0018
Treasure Island	40200102	0	0	default value	25	0.29	0.0008	0.0008	0.0008
Erickson International	40200701	0	0	default value	25	1.97	0.0054	0.0054	0.0054
Manheim Nevada	40201001	0	0	default value	25	0.28	0.0008	0.0008	0.0008
McCarran International Airport	40201101	0	0	default value	25	0.17	0.0005	0.0005	0.0005
MGM Grand/New York New York	40201101	0	0	default value	25	1.69	0.0046	0.0046	0.0046
Catalina Plastic and Coating	40201399	0	0	2016 v.1	25	11.13	0.0305	0.0305	0.0305
GE Transport	40201501	0	0	default value	25	1.04	0.0028	0.0028	0.0028
Manheim Nevada	40201601	0	0	default value	25	4.43	0.0121	0.0121	0.0121
Republic Services Transfer Station	40201601	0	0	default value	25	4.83	0.0132	0.0132	0.0132
Ritchie Brothers	40201601	0	0	default value	25	0.96	0.0026	0.0026	0.0026
Shelby American	40201606	0	0	default value	25	1.54	0.0042	0.0042	0.0042
Plasticard Locktech	40202201	-0.0002	0.0007	2016 v.1	25	10.64	0.0292	0.0291	0.0293
Univeral Urethane	40202201	-0.0002	0.0007	2016 v.1	25	7.88	0.0216	0.0216	0.0217
Creech AFB	40202501	0.018	0.0012	2016 v.1	25	0.44	0.0012	0.0013	0.0014
Nellis AFB	40202501	0.018	0.0012	2016 v.1	25	1.40	0.0038	0.0042	0.0043
Preferred Laminations	40202501	0.018	0.0012	2016 v.1	25	4.41	0.0121	0.0134	0.0135
Tropicana Laughlin	40202501	0.018	0.0012	2016 v.1	25	0.05	0.0001	0.0002	0.0002
Boral Roofing	40299995	0	0	default value	25	2.86	0.0078	0.0078	0.0078
Pro Terminal Operators	40400150	0	0	2016 v.1	25	15.39	0.0422	0.0422	0.0422
UNEV Pipeline	40400152	-0.0108	-0.0222	2016 v.1	25	17.66	0.0484	0.0452	0.0362
Lasfuel McCarran Tank Farm	40400153	0	0	default value	25	0.00	0.0000	0.0000	0.0000

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
UNEV Pipeline	40400172	-0.0132	-0.02402	2016 v.1	25	17.36	0.0476	0.0438	0.0343
Pro Terminal Operators	40400178	-0.013	-0.0236	2016 v.1	25	12.18	0.0334	0.0308	0.0242
Lasfuel McCarran Tank Farm	40400199	0	0	2016 v.1	25	14.30	0.0392	0.0392	0.0392
Lasfuel McCarran Tank Farm	40400250	0	0	default value	25	0.49	0.0013	0.0013	0.0013
Harrah's Laughlin	40400301	0	0	2016 v.1	25	1.22	0.0033	0.0033	0.0033
Southern Desert Correctional Center	40400301	0	0	2016 v.1	25	0.01	0.0000	0.0000	0.0000
CPP Acquisition	40500101	0	0	default value	25	0.67	0.0018	0.0018	0.0018
CPP Acquisition	40500401	-0.0025	-0.0008	2016 v.1	25	20.49	0.0561	0.0553	0.0549
Las Vegas Color Graphics	40500411	0.0042	0.0003	2016 v.1	25	7.30	0.0200	0.0205	0.0206
Las Vegas Review Journal	40500417	0.0011	0.0007	2016 v.1	25	8.08	0.0221	0.0223	0.0224
Nevada Color Litho	40500433	0.0042	0.0003	2016 v.1	25	18.86	0.0517	0.0530	0.0531
West Rock	40500501	0.0042	0.0003	2016 v.1	25	10.86	0.0298	0.0305	0.0306
Berry Plastics Corporation	40500802	-0.0031	-0.0005	2016 v.1	25	5.63	0.0154	0.0151	0.0151
Letica Corporation	40500802	-0.0031	-0.0005	2016 v.1	25	2.67	0.0073	0.0072	0.0071
Beltway Complex	40600306	0	0	default value	25	0.29	0.0008	0.0008	0.0008
High Desert State Prison	40600306	0	0	default value	25	0.45	0.0012	0.0012	0.0012
McCarran Rent a Car Center	40600306	0	0	default value	25	8.39	0.0230	0.0230	0.0230
Republic Services Transfer Station	40600306	0	0	default value	25	0.38	0.0010	0.0010	0.0010
Shelby American	40600306	0	0	default value	25	0.13	0.0004	0.0004	0.0004
Wynn Las Vegas	40600306	0	0	default value	25	0.07	0.0002	0.0002	0.0002
Manheim Nevada	40600401	0	0	default value	25	0.99	0.0027	0.0027	0.0027
McCarran International Airport	40600401	0	0	default value	25	0.19	0.0005	0.0005	0.0005

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
MGM Grand/New York New York	40600401	0	0	default value	25	1.93	0.0053	0.0053	0.0053
Henderson Executive Airport	40600706	0	0	default value	25	0.86	0.0024	0.0024	0.0024
Las Vegas Paving - 5th Street	40600706	0	0	default value	25	0.14	0.0004	0.0004	0.0004
North Las Vegas Airport	40600706	0	0	default value	25	1.40	0.0038	0.0038	0.0038
Creech AFB	40688801	0.005	0.0029	2016 v.1	25	4.90	0.0134	0.0138	0.0142
Nellis AFB	40688801	0.005	0.0029	2016 v.1	25	5.30	0.0145	0.0150	0.0153
Primm Valley Resorts	40688801	0.005	0.0029	2016 v.1	25	10.93	0.0299	0.0308	0.0316
Brady Linen Services	41000115	0	0	default value	25	1.76	0.0048	0.0048	0.0048
Brady Linen Services	41000130	0	0	default value	25	0.99	0.0027	0.0027	0.0027
CC Landfill Energy LLC	50100410	0	0	2016 v.1	25	0.04	0.0001	0.0001	0.0001
Kurt Segler Water Reclamation	50100765	0	0	default value	25	0.24	0.0007	0.0007	0.0007
City of Las Vegas WPCF	50100789	0	0	2016 v.1	25	0.34	0.0009	0.0009	0.0009
City of Las Vegas WPCF	50100799	0	0	2016 v.1	25	0.11	0.0003	0.0003	0.0003
City of Las Vegas WPCF	50100799	0	0	2016 v.1	25	0.21	0.0006	0.0006	0.0006
City of Las Vegas WPCF	50100799	0	0	2016 v.1	25	3.64	0.0100	0.0100	0.0100
Republic DUMPCO (Apex)	50200601	0	0	2016 v.1	25	0.08	0.0002	0.0002	0.0002
Republic Services (Sunrise)	50300601	0	0	2016 v.1	25	1.19	0.0033	0.0033	0.0033
Kinder Morgan	50410312	0	0	2016 v.1	25	59.30	0.1625	0.1625	0.1625
Total						**938.17**	**2.95**	**2.62**	**2.63**

Table 10-2. Point Source NO_x Summer Weekday Emissions Projections (tpd)

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
NV Energy (Reid-Gardner)	10100101	shutdown	shutdown		27	401.20	1.1871	0.0000	0.0000
Saguaro Power Company	10100601	0.0000	0.0000	2016 v.1	27	0.36	0.0011	0.0011	0.0011
Saguaro Power Company	10100602	0.0000	0.0000	2016 v.1	27	0.92	0.0027	0.0027	0.0027
Brady Linen Services	10200602	0.0120	0.0079	2016 v.1	25	5.02	0.0138	0.0147	0.0159
Clearwater Paper	10200602	0.0120	0.0079	2016 v.1	25	3.82	0.0105	0.0112	0.0121
Titanium Metals Corp.	10200602	0.0120	0.0079	2016 v.1	25	1.31	0.0036	0.0038	0.0042
Kern River (Goodsprings)	10200603	0.6800	0.0126	2016 v.1	25	0.18	0.0005	0.0025	0.0028
NV Energy (Chuck Lenzie)	10200603	0.6800	0.0126	2016 v.1	25	0.24	0.0007	0.0033	0.0038
NV Energy (Chuck Lenzie)	10200603	0.6800	0.0126	2016 v.1	25	0.24	0.0007	0.0033	0.0038
Titanium Metals Corp.	10201402	0.0004	0.0048	2016 v.1	25	8.33	0.0228	0.0229	0.0240
High Desert State Prison	10300502	0.0073	-0.0058	2016 v.1	25	17.75	0.0486	0.0507	0.0478
2755 Las Vegas	10300602	0.0161	0.0012	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Aggregate Industries	10300602	0.0161	0.0012	2016 v.1	25	2.80	0.0077	0.0084	0.0085
Aggregate Industries	10300602	0.0161	0.0012	2016 v.1	25	0.51	0.0014	0.0015	0.0016
Centennial Hills Hospital	10300602	0.0161	0.0012	2016 v.1	25	0.75	0.0021	0.0023	0.0023
Cosmopolitan Las Vegas	10300602	0.0161	0.0012	2016 v.1	25	2.43	0.0067	0.0073	0.0074
McCarran International Airport	10300602	0.0161	0.0012	2016 v.1	25	3.32	0.0091	0.0100	0.0101
Nellis AFB	10300602	0.0161	0.0012	2016 v.1	25	5.63	0.0154	0.0169	0.0171
NV Energy (Walter Higgins)	10300602	0.0161	0.0012	2016 v.1*	31	0.30	0.0010	0.0011	0.0011
Red Rock Casino Resort	10300602	0.0161	0.0012	2016 v.1	25	3.90	0.0107	0.0117	0.0119
Resorts World	10300602	0.0161	0.0012	2016 v.1	25	0.00	0.0000	0.0000	0.0000
SLS Las Vegas	10300602	0.0161	0.0012	2016 v.1	25	3.13	0.0086	0.0094	0.0095
South Point Hotal and Casino	10300602	0.0161	0.0012	2016 v.1	25	3.05	0.0084	0.0092	0.0093
Tronox	10300602	0.0161	0.0012	2016 v.1	25	5.14	0.0141	0.0154	0.0156
Tronox	10300602	0.0161	0.0012	2016 v.1	25	0.70	0.0019	0.0021	0.0021
Veterans Administration	10300602	0.0161	0.0012	2016 v.1	25	2.02	0.0055	0.0061	0.0061

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
World Market Center	10300602	0.0161	0.0012	2016 v.1	25	0.07	0.0002	0.0002	0.0002
Wynn Las Vegas	10300602	0.0161	0.0012	2016 v.1	25	4.96	0.0136	0.0149	0.0151
BKEP Materials	10300603	0.0161	0.0012	2016 v.1	25	0.45	0.0012	0.0014	0.0014
Boulder Station Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	1.76	0.0048	0.0053	0.0054
Caesars Consolidated	10300603	0.0161	0.0012	2016 v.1	25	19.90	0.0545	0.0598	0.0605
Cancun Resort	10300603	0.0161	0.0012	2016 v.1	25	2.85	0.0078	0.0086	0.0087
CCWRD Flamingo Center	10300603	0.0161	0.0012	2016 v.1	25	7.53	0.0206	0.0226	0.0229
Chemical Lime (Apex)	10300603	0.0161	0.0012	2016 v.1	25	0.60	0.0016	0.0018	0.0018
Circus Circus Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	4.52	0.0124	0.0136	0.0137
City of Henderson Downtown	10300603	0.0161	0.0012	2016 v.1	25	0.90	0.0025	0.0027	0.0027
Clark County Downtown Campus	10300603	0.0161	0.0012	2016 v.1	25	4.18	0.0115	0.0126	0.0127
Creech AFB	10300603	0.0161	0.0012	2016 v.1	25	2.70	0.0074	0.0081	0.0082
Edgewater Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	3.09	0.0085	0.0093	0.0094
Gold Coast Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	1.26	0.0035	0.0038	0.0038
Golden Nugget Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	0.89	0.0024	0.0027	0.0027
Green Valley Ranch Resort	10300603	0.0161	0.0012	2016 v.1	25	1.42	0.0039	0.0043	0.0043
Hard Rock Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	0.67	0.0018	0.0020	0.0020
Harrah's Laughlin	10300603	0.0161	0.0012	2016 v.1	25	2.21	0.0061	0.0066	0.0067
Horseshoe Club	10300603	0.0161	0.0012	2016 v.1	25	17.45	0.0478	0.0524	0.0531
JW Marriott Las Vegas	10300603	0.0161	0.0012	2016 v.1	25	2.13	0.0058	0.0064	0.0065
Kern River (Dry Lake-Apex)	10300603	0.0161	0.0012	2016 v.1	25	0.14	0.0004	0.0004	0.0004
McCarran Rent a Car Center	10300603	0.0161	0.0012	2016 v.1	25	0.10	0.0003	0.0003	0.0003
MGM Grand/New York New York	10300603	0.0161	0.0012	2016 v.1	25	40.26	0.1103	0.1210	0.1224
Mirage/Treasure Island	10300603	0.0161	0.0012	2016 v.1	25	7.81	0.0214	0.0235	0.0237

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Mountain View Hospital	10300603	0.0161	0.0012	2016 v.1	25	0.83	0.0023	0.0025	0.0025
Northwind Alladin	10300603	0.0161	0.0012	2016 v.1	25	2.07	0.0057	0.0062	0.0063
Orleans Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	7.45	0.0204	0.0224	0.0227
Palace Station Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	8.84	0.0242	0.0266	0.0269
Palms Casino Resort	10300603	0.0161	0.0012	2016 v.1	25	2.94	0.0081	0.0088	0.0089
Plasticard Locktech	10300603	0.0161	0.0012	2016 v.1	25	0.91	0.0025	0.0027	0.0028
Primm Valley Resorts	10300603	0.0161	0.0012	2016 v.1	25	13.17	0.0361	0.0396	0.0401
Progress Rail	10300603	0.0161	0.0012	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Republic Services Transfer Station	10300603	0.0161	0.0012	2016 v.1	25	0.06	0.0002	0.0002	0.0002
Rio All Suites Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	22.77	0.0624	0.0684	0.0692
Riverside Resort	10300603	0.0161	0.0012	2016 v.1	25	0.57	0.0016	0.0017	0.0017
Sams Town Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	4.24	0.0116	0.0127	0.0129
Santa Fe Station	10300603	0.0161	0.0012	2016 v.1	25	4.12	0.0113	0.0124	0.0125
Southern Desert Correctional Center	10300603	0.0161	0.0012	2016 v.1	25	2.48	0.0068	0.0075	0.0075
St Rose Dominican Siena	10300603	0.0161	0.0012	2016 v.1	25	6.00	0.0164	0.0180	0.0182
Stratosphere Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	1.61	0.0044	0.0048	0.0049
Suncoast Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	1.58	0.0043	0.0047	0.0048
Sunset Station	10300603	0.0161	0.0012	2016 v.1	25	2.16	0.0059	0.0065	0.0066
Texas Station Casino	10300603	0.0161	0.0012	2016 v.1	25	2.79	0.0076	0.0084	0.0085
Treasure Island	10300603	0.0161	0.0012	2016 v.1	25	4.34	0.0119	0.0130	0.0132
Tropicana Laughlin	10300603	0.0161	0.0012	2016 v.1	25	2.03	0.0056	0.0061	0.0062
University Medical Center	10300603	0.0161	0.0012	2016 v.1	25	1.27	0.0035	0.0038	0.0039
University of Nevada, Las Vegas	10300603	0.0161	0.0012	2016 v.1	25	5.36	0.0147	0.0161	0.0163
Venetian Hotel and Casino	10300603	0.0161	0.0012	2016 v.1	25	13.75	0.0377	0.0413	0.0418

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Westgate Las Vegas	10300603	0.0161	0.0012	2016 v.1	25	3.10	0.0085	0.0093	0.0094
NV Energy (Chuck Lenzie)	10500206	0.0161	0.0012	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Switch Communications	20022102	0.0000	0.0000	2016 v.1	25	33.23	0.0910	0.0910	0.0910
Aggregate Industries	20100102	0.0000	0.0000	2016 v.1	25	4.01	0.0110	0.0110	0.0110
Aggregate Industries	20100102	0.0000	0.0000	2016 v.1	25	0.38	0.0010	0.0010	0.0010
Chemical Lime (Apex)	20100102	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Chemical Lime (Apex)	20100102	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Edgewater Hotel and Casino	20100102	0.0000	0.0000	2016 v.1	25	6.48	0.0178	0.0178	0.0178
Georgia Pacific	20100102	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	20100102	0.0000	0.0000	2016 v.1	25	0.04	0.0001	0.0001	0.0001
Harrah's Laughlin	20100102	0.0000	0.0000	2016 v.1	25	0.41	0.0011	0.0011	0.0011
Henderson Executive Airport	20100102	0.0000	0.0000	2016 v.1	25	0.10	0.0003	0.0003	0.0003
High Desert State Prison	20100102	0.0000	0.0000	2016 v.1	25	1.84	0.0050	0.0050	0.0050
Las Vegas Cogeneration	20100102	0.0000	0.0000	2016 v.1	51	0.04	0.0002	0.0002	0.0002
Las Vegas Cogeneration	20100102	0.0000	0.0000	2016 v.1	51	0.08	0.0004	0.0004	0.0004
Las Vegas Power Company, LLC	20100102	0.0000	0.0000	2016 v.1	45	2.40	0.0118	0.0118	0.0118
Las Vegas Power Company, LLC	20100102	0.0357	0.0000	IPM	45	0.10	0.0005	0.0006	0.0006
Las Vegas Power Company, LLC	20100102	0.0357	0.0000	ERTAC	45	0.11	0.0005	0.0007	0.0007
Manheim Nevada	20100102	0.0000	0.0000	2016 v.1	25	0.33	0.0009	0.0009	0.0009
McCarran Rent a Car Center	20100102	0.0000	0.0000	2016 v.1	25	0.03	0.0001	0.0001	0.0001
North Las Vegas Airport	20100102	0.0000	0.0000	2016 v.1	25	0.06	0.0002	0.0002	0.0002
NV Energy (Chuck Lenzie)	20100102	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000
NV Energy (Harry Allen)	20100102	0.0000	0.0000	2016 v.1	80	0.35	0.0031	0.0031	0.0031
NV Energy (Harry Allen)	20100102	0.0000	0.0000	2016 v.1	80	0.02	0.0002	0.0002	0.0002
NV Energy (Harry Allen)	20100102	0.0000	0.0000	2016 v.1	80	0.23	0.0020	0.0020	0.0020

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
NV Energy (Harry Allen)	20100102	0.0000	0.0000	2016 v.1	80	0.02	0.0002	0.0002	0.0002
Primm Valley Resorts	20100102	0.0000	0.0000	2016 v.1	25	1.56	0.0043	0.0043	0.0043
Riverside Resort	20100102	0.0000	0.0000	2016 v.1	25	1.00	0.0027	0.0027	0.0027
Saguaro Power Company	20100102	0.0000	0.0000	2016 v.1	27	0.06	0.0002	0.0002	0.0002
Saguaro Power Company	20100102	0.0000	0.0000	2016 v.1	27	0.08	0.0002	0.0002	0.0002
Tropicana Laughlin	20100102	0.0000	0.0000	2016 v.1	25	0.25	0.0007	0.0007	0.0007
Westgate Las Vegas	20100102	0.0000	0.0000	2016 v.1	25	0.27	0.0007	0.0007	0.0007
Wynn Las Vegas	20100102	0.0000	0.0000	2016 v.1	25	4.90	0.0134	0.0134	0.0134
El Dorado Energy	20100201	0.0357	0.0000	2016 v.1	27	25.88	0.0766	0.0930	0.0930
El Dorado Energy	20100201	0.0357	0.0000	2016 v.1	27	30.94	0.0915	0.1112	0.1112
Las Vegas Cogeneration	20100201	0.0357	0.0000	2016 v.1	51	5.33	0.0298	0.0362	0.0362
Las Vegas Cogeneration	20100201	0.0357	0.0000	2016 v.1	51	2.00	0.0112	0.0136	0.0136
Las Vegas Cogeneration	20100201	0.0357	0.0000	2016 v.1	51	2.75	0.0154	0.0187	0.0187
Las Vegas Cogeneration	20100201	0.0357	0.0000	2016 v.1	51	2.72	0.0152	0.0185	0.0185
Las Vegas Cogeneration	20100201	0.0357	0.0000	2016 v.1	51	2.86	0.0160	0.0194	0.0194
Las Vegas Power Company, LLC	20100201	0.0357	0.0000	2016 v.1	45	56.20	0.2772	0.3365	0.3365
Las Vegas Power Company, LLC	20100201	0.0357	0.0000	2016 v.1	45	58.30	0.2875	0.3491	0.3491
MGM Grand/New York New York	20100201	0.0357	0.0000	2016 v.1	25	6.21	0.0170	0.0207	0.0207
Nevada Cogeneration Assoc. #2	20100201	0.0357	0.0000	2016 v.1	27	0.01	0.0000	0.0000	0.0000
Nevada Sun Peak Partnerships	20100201	0.0081	0.0024	ERTAC	37	6.73	0.0273	0.0286	0.0293
Nevada Sun Peak Partnerships	20100201	0.0050	0.0029	ERTAC	37	5.10	0.0207	0.0213	0.0219
Nevada Sun Peak Partnerships	20100201	0.0085	0.0050	ERTAC	37	4.06	0.0165	0.0173	0.0182
NV Energy (Chuck Lenzie)	20100201	-0.0065	-0.0013	ERTAC	25	58.41	0.1600	0.1538	0.1518
NV Energy (Chuck Lenzie)	20100201	-0.0066	-0.0011	ERTAC	25	58.33	0.1598	0.1535	0.1519

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
NV Energy (Chuck Lenzie)	20100201	-0.0065	-0.0011	ERTAC	25	55.06	0.1508	0.1450	0.1433
NV Energy (Chuck Lenzie)	20100201	-0.0067	-0.0014	ERTAC	25	58.80	0.1611	0.1546	0.1525
NV Energy (Clark Station)	20100201	0.0357	0.0000	2016 v.1	27	8.70	0.0257	0.0313	0.0313
NV Energy (Clark Station)	20100201	0.0357	-0.0505	2016 v.1 2023; IPM 2016-2030	27	10.20	0.0302	0.0366	0.0181
NV Energy (Clark Station)	20100201	0.0357	-0.0611	2016 v.1 2023; IPM 2016-2030	27	10.40	0.0308	0.0374	0.0145
NV Energy (Clark Station)	20100201	0.0357	-0.05136	2016 v.1 2023; IPM 2016-2030	27	7.90	0.0234	0.0284	0.0138
NV Energy (Clark Station)	20100201	0.0357	-0.06366	2016 v.1 2023; IPM 2016-2030	27	11.20	0.0331	0.0402	0.0146
NV Energy (Clark Station)	20100201	0.027778	0.015385	ERTAC	27	2.95	0.0087	0.0102	0.0118
NV Energy (Clark Station)	20100201	0	0.02	ERTAC	27	4.68	0.0138	0.0138	0.0166
NV Energy (Clark Station)	20100201	0.021739	0.012245	ERTAC	27	3.24	0.0096	0.0108	0.0122
NV Energy (Clark Station)	20100201	0.02381	0.017778	ERTAC	27	5.33	0.0158	0.0180	0.0212
NV Energy (Clark Station)	20100201	0.014493	0.016667	ERTAC	27	3.39	0.0100	0.0109	0.0127
NV Energy (Clark Station)	20100201	0.026316	0.014634	ERTAC	27	3.70	0.0109	0.0127	0.0145
NV Energy (Clark Station)	20100201	0.010101	0.023529	ERTAC	27	3.22	0.0095	0.0101	0.0125
NV Energy (Clark Station)	20100201	0.020202	0.011429	ERTAC	27	4.25	0.0126	0.0141	0.0157
NV Energy (Clark Station)	20100201	0.014493	0.016667	ERTAC	27	3.13	0.0093	0.0101	0.0117
NV Energy (Clark Station)	20100201	0.028986	0.012	ERTAC	27	4.19	0.0124	0.0146	0.0163
NV Energy (Clark Station)	20100201	0.019608	0.011111	ERTAC	27	3.08	0.0091	0.0102	0.0113
NV Energy (Clark Station)	20100201	0.02381	0.013333	ERTAC	27	3.25	0.0096	0.0110	0.0125
NV Energy (Harry Allen)	20100201	0.0139	0.0080	ERTAC	80	5.60	0.0491	0.0532	0.0574

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
NV Energy (Harry Allen)	20100201	-0.0058	-0.0013	ERTAC	80	29.32	0.2571	0.2481	0.2448
NV Energy (Harry Allen)	20100201	-0.0060	-0.0012	ERTAC	80	31.39	0.2752	0.2652	0.2620
NV Energy (Harry Allen)	20100201	0.0278	0.0231	ERTAC	80	5.60	0.0491	0.0573	0.0705
NV Energy (Silverhawk)	20100201	-0.0064	-0.0007	ERTAC	30	39.30	0.1292	0.1242	0.1233
NV Energy (Silverhawk)	20100201	-0.0053	-0.0013	ERTAC	30	40.20	0.1322	0.1280	0.1263
NV Energy (Walter Higgins)	20100201	-0.00648	-0.00122	ERTAC	31	39.90	0.1356	0.1303	0.1287
NV Energy (Walter Higgins)	20100201	-0.00571	-0.00127	ERTAC	31	38.10	0.1294	0.1250	0.1234
Saguaro Power Company	20100201	0.0357	0.0000	2016 v.1*	27	51.92	0.1536	0.1865	0.1865
Saguaro Power Company	20100201	0.0357	0.0000	2016 v.1*	27	49.45	0.1463	0.1777	0.1777
CC Landfill Energy LLC	20100801	0.0000	0.0000	IPM	25	31.18	0.0854	0.0854	0.0854
Nevada Cogeneration Assoc. #2	20200101	0.0220	0.0078	2016 v.1	27	0.16	0.0005	0.0005	0.0006
Nevada Cogeneration Assoc. #2	20200101	0.0220	0.0078	2016 v.1	27	0.10	0.0003	0.0003	0.0004
Biodiesel of Las Vegas	20200102	0.0238	0.0006	2016 v.1	25	0.02	0.0001	0.0001	0.0001
City of Las Vegas WPCF	20200102	0.0238	0.0006	2016 v.1	25	1.01	0.0028	0.0032	0.0032
Creech AFB	20200102	0.0238	0.0006	2016 v.1	25	12.00	0.0329	0.0376	0.0378
El Dorado Energy	20200102	0.0238	0.0006	2016 v.1	27	0.07	0.0002	0.0002	0.0002
Fisher Sand and Gravel	20200102	0.0238	0.0006	2016 v.1	25	14.42	0.0395	0.0451	0.0454
H Lima Nevada	20200102	0.0238	0.0006	2016 v.1	25	10.57	0.0290	0.0331	0.0333
Kinder Morgan	20200102	0.0238	0.0006	2016 v.1	25	0.07	0.0002	0.0002	0.0002
Kurt Segler Water Reclamation	20200102	0.0238	0.0006	2016 v.1	25	7.70	0.0211	0.0241	0.0243
Las Vegas Paving - 5th Street	20200102	0.0238	0.0006	2016 v.1	25	0.06	0.0002	0.0002	0.0002
Las Vegas Paving - Lone Mountain	20200102	0.0238	0.0006	2016 v.1	25	44.93	0.1231	0.1407	0.1415
McCarran International Airport	20200102	0.0238	0.0006	2016 v.1	25	4.69	0.0128	0.0147	0.0148
Nevada Cogeneration Assoc. #1	20200102	0.0238	0.0006	2016 v.1	27	0.19	0.0006	0.0006	0.0006

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Nevada Cogeneration Assoc. #1	20200102	0.0238	0.0006	2016 v.1	27	0.01	0.0000	0.0000	0.0000
Nevada Cogeneration Assoc. #1	20200102	0.0238	0.0006	2016 v.1	27	0.20	0.0006	0.0007	0.0007
Nikkiso Cryo	20200102	0.0238	0.0006	2016 v.1	25	8.90	0.0244	0.0279	0.0280
NV Energy (Chuck Lenzie)	20200102	0.0238	0.0006	2016 v.1	25	0.07	0.0002	0.0002	0.0002
NV Energy (Clark Station)	20200102	0.0238	0.0006	2016 v.1	27	0.01	0.0000	0.0000	0.0000
NV Energy (Clark Station)	20200102	0.0238	0.0006	2016 v.1	27	0.01	0.0000	0.0000	0.0000
NV Energy (Clark Station)	20200102	0.0238	0.0006	2016 v.1	27	0.01	0.0000	0.0000	0.0000
NV Energy (Clark Station)	20200102	0.0238	0.0006	2016 v.1	27	0.01	0.0000	0.0000	0.0000
NV Energy (Silverhawk)	20200102	0.0238	0.0006	2016 v.1	30	1.16	0.0038	0.0044	0.0044
NV Energy (Silverhawk)	20200102	0.0238	0.0006	2016 v.1	30	0.02	0.0001	0.0001	0.0001
NV Energy (Walter Higgins)	20200102	0.0238	0.0006	2016 v.1	31	0.04	0.0001	0.0002	0.0002
Olin Chlor Alkali Products	20200102	0.0238	0.0006	2016 v.1	25	0.86	0.0024	0.0027	0.0027
Republic DUMPCO (Apex)	20200102	0.0238	0.0006	2016 v.1	25	46.83	0.1283	0.1466	0.1475
Service Rock Products	20200102	0.0238	0.0006	2016 v.1	25	91.77	0.2514	0.2873	0.2891
Southern Desert Correctional Center	20200102	0.0238	0.0006	2016 v.1	25	11.61	0.0318	0.0364	0.0366
UNEV Pipeline	20200102	0.0238	0.0006	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Kern River (Goodsprings)	20200201	-0.0064	-0.0117	2016 v.1	25	40.69	0.1115	0.1072	0.0947
City of Las Vegas WPCF	20200202	-0.0076	-0.0133	2016 v.1	25	0.10	0.0003	0.0003	0.0002
Georgia Pacific	20200202	-0.0076	-0.0133	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	20200202	-0.0076	-0.0133	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	20200202	-0.0076	-0.0133	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	20200202	-0.0076	-0.0133	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	20200202	-0.0076	-0.0133	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Kern River (Dry Lake-Apex)	20200202	-0.0076	-0.0133	2016 v.1	25	0.06	0.0002	0.0002	0.0001
Kern River (Goodsprings)	20200253	-0.0274	-0.0120	2016 v.1	25	0.14	0.0004	0.0003	0.0003

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Certain Teed Gypsum	20200401	0.0170	0.0001	2016 v.1	25	1.67	0.0046	0.0050	0.0050
Certain Teed Gypsum	20200401	0.0170	0.0001	2016 v.1	25	0.03	0.0001	0.0001	0.0001
NV Energy (Chuck Lenzie)	20201001	-0.0572	0.0029	2016 v.1	25	0.20	0.0005	0.0004	0.0004
NV Energy (Chuck Lenzie)	20201001	-0.0572	0.0029	2016 v.1	25	0.15	0.0004	0.0003	0.0003
2755 Las Vegas	20300101	0.0219	-0.0034	2016 v.1	25	0.71	0.0019	0.0022	0.0021
Beltway Complex	20300101	0.0219	-0.0034	2016 v.1	25	1.05	0.0029	0.0033	0.0031
Berry Plastics Corporation	20300101	0.0219	-0.0034	2016 v.1	25	0.09	0.0002	0.0003	0.0003
Blue Diamond Hill Gypsum	20300101	0.0219	-0.0034	2016 v.1	25	73.04	0.2001	0.2264	0.2187
Boulder Station Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.98	0.0027	0.0030	0.0029
Cancun Resort	20300101	0.0219	-0.0034	2016 v.1	25	0.47	0.0013	0.0015	0.0014
CDW Logistics	20300101	0.0219	-0.0034	2016 v.1	25	0.52	0.0014	0.0016	0.0016
Centennial Hills Hospital	20300101	0.0219	-0.0034	2016 v.1	25	2.05	0.0056	0.0064	0.0061
Citibank The Lakes	20300101	0.0219	-0.0034	2016 v.1	25	0.28	0.0008	0.0009	0.0008
City of Henderson Downtown	20300101	0.0219	-0.0034	2016 v.1	25	1.09	0.0030	0.0034	0.0033
Clark County Downtown Campus	20300101	0.0219	-0.0034	2016 v.1	25	2.47	0.0068	0.0077	0.0074
Cosmopolitan Las Vegas	20300101	0.0219	-0.0034	2016 v.1	25	0.21	0.0006	0.0007	0.0006
CTC Crushing	20300101	0.0219	-0.0034	2016 v.1	25	11.35	0.0311	0.0352	0.0340
Freeman	20300101	0.0219	-0.0034	2016 v.1	25	0.11	0.0003	0.0003	0.0003
Gold Coast Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	1.07	0.0029	0.0033	0.0032
Green Valley Ranch Resort	20300101	0.0219	-0.0034	2016 v.1	25	0.45	0.0012	0.0014	0.0013
Hard Rock Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.81	0.0022	0.0025	0.0024
JW Marriott Las Vegas	20300101	0.0219	-0.0034	2016 v.1	25	0.40	0.0011	0.0012	0.0012
Las Vegas Review Journal	20300101	0.0219	-0.0034	2016 v.1	25	1.35	0.0037	0.0042	0.0040
Lasfuel McCarran Tank Farm	20300101	0.0219	-0.0034	2016 v.1	25	0.77	0.0021	0.0024	0.0023
MGM Grand/New York New York	20300101	0.0219	-0.0034	2016 v.1	25	18.60	0.0510	0.0577	0.0557

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Mountain View Hospital	20300101	0.0219	-0.0034	2016 v.1	25	1.26	0.0035	0.0039	0.0038
Orleans Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.58	0.0016	0.0018	0.0017
Palace Station Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.54	0.0015	0.0017	0.0016
Palms Casino Resort	20300101	0.0219	-0.0034	2016 v.1	25	0.38	0.0010	0.0012	0.0011
Red Rock Casino Resort	20300101	0.0219	-0.0034	2016 v.1	25	1.73	0.0047	0.0054	0.0052
Republic Services Transfer Station	20300101	0.0219	-0.0034	2016 v.1	25	0.23	0.0006	0.0007	0.0007
Resorts World	20300101	0.0219	-0.0034	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Rio All Suites Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	1.64	0.0045	0.0051	0.0049
Ritchie Brothers	20300101	0.0219	-0.0034	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Sams Town Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.74	0.0020	0.0023	0.0022
Santa Fe Station	20300101	0.0219	-0.0034	2016 v.1	25	0.55	0.0015	0.0017	0.0016
SLS Las Vegas	20300101	0.0219	-0.0034	2016 v.1	25	0.29	0.0008	0.0009	0.0009
South Point Hotal and Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.79	0.0022	0.0024	0.0024
St Rose Dominican Siena	20300101	0.0219	-0.0034	2016 v.1	25	1.24	0.0034	0.0038	0.0037
Stratosphere Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	5.23	0.0143	0.0162	0.0157
Suncoast Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	1.06	0.0029	0.0033	0.0032
Sunset Station	20300101	0.0219	-0.0034	2016 v.1	25	0.35	0.0010	0.0011	0.0010
Switch	20300101	0.0219	-0.0034	2016 v.1	25	1.83	0.0050	0.0057	0.0055
Terra Firma Organics	20300101	0.0219	-0.0034	2016 v.1	25	3.34	0.0092	0.0104	0.0100
Texas Station Casino	20300101	0.0219	-0.0034	2016 v.1	25	0.47	0.0013	0.0015	0.0014
Treasure Island	20300101	0.0219	-0.0034	2016 v.1	25	0.32	0.0009	0.0010	0.0010
Tronox	20300101	0.0219	-0.0034	2016 v.1	25	0.04	0.0001	0.0001	0.0001
Tronox	20300101	0.0219	-0.0034	2016 v.1	25	0.10	0.0003	0.0003	0.0003
Tronox	20300101	0.0219	-0.0034	2016 v.1	25	0.10	0.0003	0.0003	0.0003

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Tronox	20300101	0.0219	-0.0034	2016 v.1	25	0.37	0.0010	0.0011	0.0011
University Medical Center	20300101	0.0219	-0.0034	2016 v.1	25	2.76	0.0076	0.0086	0.0083
University of Nevada, Las Vegas	20300101	0.0219	-0.0034	2016 v.1	25	2.21	0.0061	0.0069	0.0066
Venetian Hotel and Casino	20300101	0.0219	-0.0034	2016 v.1	25	4.09	0.0112	0.0127	0.0122
Verizon Business	20300101	0.0219	-0.0034	2016 v.1	25	0.96	0.0026	0.0030	0.0029
Veterans Administration	20300101	0.0219	-0.0034	2016 v.1	25	2.86	0.0078	0.0089	0.0086
Viawest	20300101	0.0219	-0.0034	2016 v.1	25	1.11	0.0030	0.0034	0.0033
Viawest Lone Mountain Data Center	20300101	0.0219	-0.0034	2016 v.1	25	0.40	0.0011	0.0012	0.0012
Wells Cargo Lone Mountain	20300101	0.0219	-0.0034	2016 v.1	25	39.42	0.1080	0.1222	0.1180
World Market Center	20300101	0.0219	-0.0034	2016 v.1	25	2.59	0.0071	0.0080	0.0078
Nevada Cogeneration Assoc. #1	20300203	-0.0300	0.0000	IPM	27	35.29	0.1044	0.0856	0.0856
Nevada Cogeneration Assoc. #1	20300203	-0.0925	0.0000	IPM	27	36.91	0.1092	0.0486	0.0486
Nevada Cogeneration Assoc. #1	20300203	-0.0922	0.0000	IPM	27	34.49	0.1021	0.0456	0.0456
Nevada Cogeneration Assoc. #2	20300203	0.0028	0.0000	IPM	27	36.89	0.1092	0.1110	0.1110
Nevada Cogeneration Assoc. #2	20300203	-0.0789	0.0000	IPM	27	34.73	0.1028	0.0541	0.0541
Nevada Cogeneration Assoc. #2	20300203	-0.0789	0.0000	IPM	27	35.24	0.1043	0.0549	0.0549
Nellis AFB	20300301	0.0021	0.0009	2016 v.1	25	4.77	0.0131	0.0132	0.0134
NBC Fourth Realty	20301001	0.0279	0.0140	2016 v.1	25	5.92	0.0162	0.0189	0.0216
Nellis AFB	20400110	0.0122	0.0112	2016 v.1	25	9.18	0.0252	0.0270	0.0300
Tronox	30107002	0.0000	0.0000	2016 v.1	25	6.07	0.0166	0.0166	0.0166
Tronox	30107002	0.0000	0.0000	2016 v.1	25	1.20	0.0033	0.0033	0.0033
Erickson International	30190013	0.0000	0.0000	default value	25	0.06	0.0002	0.0002	0.0002
Titanium Metals Corp.	30301201	0.0000	0.0000	default value	25	1.07	0.0029	0.0029	0.0029

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Titanium Metals Corp.	30301202	0.0000	0.0000	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Titanium Metals Corp.	30301299	0.0000	0.0000	2016 v.1	25	12.41	0.0340	0.0340	0.0340
Titanium Metals Corp.	30301299	0.0000	0.0000	2016 v.1	25	0.10	0.0003	0.0003	0.0003
Aggregate Industries - Gowan	30500205	0.0000	0.0000	2016 v.1	25	5.12	0.0140	0.0140	0.0140
Las Vegas Paving	30500205	0.0000	0.0000	2016 v.1	25	1.63	0.0045	0.0045	0.0045
Las Vegas Paving - 5th Street	30500205	0.0000	0.0000	2016 v.1	25	4.15	0.0114	0.0114	0.0114
Las Vegas Paving - Lone Mountain	30500205	0.0000	0.0000	2016 v.1	25	5.71	0.0156	0.0156	0.0156
Nellis AFB	30500205	0.0000	0.0000	2016 v.1	25	0.23	0.0006	0.0006	0.0006
Las Vegas Paving - 5th Street	30500206	0.0000	0.0000	2016 v.1	25	0.59	0.0016	0.0016	0.0016
Wells Cargo	30500206	0.0000	0.0000	2016 v.1	25	0.62	0.0017	0.0017	0.0017
Aggregate Industries	30500208	0.0000	0.0000	2016 v.1	25	0.23	0.0006	0.0006	0.0006
Aggregate Industries	30500208	0.0000	0.0000	2016 v.1	25	0.01	0.0000	0.0000	0.0000
Aggregate Industries - Gowan	30500208	0.0000	0.0000	2016 v.1	25	1.13	0.0031	0.0031	0.0031
Las Vegas Paving	30500208	0.0000	0.0000	2016 v.1	25	0.23	0.0006	0.0006	0.0006
Las Vegas Paving - Lone Mountain	30500209	0.0000	0.0000	default value	25	0.31	0.0008	0.0008	0.0008
Aggregate Industries - Gowan	30500212	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
Fisher Sand and Gravel	30500212	0.0000	0.0000	default value	25	0.47	0.0013	0.0013	0.0013
Fisher Sand and Gravel	30500212	0.0000	0.0000	default value	25	0.77	0.0021	0.0021	0.0021
Aggregate Industries	30500242	0.0000	0.0000	2016 v.1	25	0.23	0.0006	0.0006	0.0006
Las Vegas Paving - Blue Diamond	30500257	0.0000	0.0000	2016 v.1	25	2.98	0.0082	0.0082	0.0082
Wells Cargo	30500257	0.0000	0.0000	2016 v.1	25	7.12	0.0195	0.0195	0.0195
Fisher Sand and Gravel	30500298	0.0000	0.0000	2016 v.1	25	3.24	0.0089	0.0089	0.0089
Boral Roofing	30500850	0.0000	0.0000	2016 v.1	25	0.29	0.0008	0.0008	0.0008

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
PABCO Gypsum	30501501	0.0000	0.0000	2016 v.1	25	0.55	0.0015	0.0015	0.0015
PABCO Gypsum	30501501	0.0000	0.0000	2016 v.1	25	7.81	0.0214	0.0214	0.0214
Georgia Pacific	30501502	0.0000	0.0000	2016 v.1	25	4.39	0.0120	0.0120	0.0120
Georgia Pacific	30501502	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000
PABCO Gypsum	30501507	0.0000	0.0000	2016 v.1	25	1.70	0.0047	0.0047	0.0047
Certain Teed Gypsum	30501511	0.0000	0.0000	default value	25	1.87	0.0051	0.0051	0.0051
Georgia Pacific	30501511	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	30501511	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
Certain Teed Gypsum	30501513	0.0000	0.0000	2016 v.1	25	7.45	0.0204	0.0204	0.0204
Georgia Pacific	30501513	0.0000	0.0000	2016 v.1	25	2.61	0.0072	0.0072	0.0072
Georgia Pacific	30501513	0.0000	0.0000	2016 v.1	25	2.68	0.0074	0.0074	0.0074
Georgia Pacific	30501513	0.0000	0.0000	2016 v.1	25	2.65	0.0073	0.0073	0.0073
Georgia Pacific	30501513	0.0000	0.0000	2016 v.1	25	2.31	0.0063	0.0063	0.0063
Georgia Pacific	30501513	0.0000	0.0000	2016 v.1	25	1.70	0.0047	0.0047	0.0047
PABCO Gypsum	30501513	0.0000	0.0000	2016 v.1	25	1.04	0.0028	0.0028	0.0028
PABCO Gypsum	30501513	0.0000	0.0000	2016 v.1	25	1.04	0.0028	0.0028	0.0028
PABCO Gypsum	30501513	0.0000	0.0000	2016 v.1	25	1.04	0.0028	0.0028	0.0028
PABCO Gypsum	30501513	0.0000	0.0000	2016 v.1	25	0.52	0.0014	0.0014	0.0014
PABCO Gypsum	30501513	0.0000	0.0000	2016 v.1	25	0.52	0.0014	0.0014	0.0014
PABCO Gypsum	30501513	0.0000	0.0000	2016 v.1	25	0.52	0.0014	0.0014	0.0014
PABCO Gypsum	30501513	0.0000	0.0000	2016 v.1	25	5.33	0.0146	0.0146	0.0146
PABCO Gypsum	30501513	0.0000	0.0000	2016 v.1	25	5.33	0.0146	0.0146	0.0146
PABCO Gypsum	30501513	0.0000	0.0000	2016 v.1	25	7.47	0.0205	0.0205	0.0205
PABCO Gypsum	30501513	0.0000	0.0000	2016 v.1	25	7.47	0.0205	0.0205	0.0205
Certain Teed Gypsum	30501520	0.0000	0.0000	2016 v.1	25	11.53	0.0316	0.0316	0.0316
Georgia Pacific	30501520	0.0000	0.0000	2016 v.1	25	24.14	0.0661	0.0661	0.0661
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	21.44	0.0587	0.0587	0.0587

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	24.15	0.0662	0.0662	0.0662
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	16.60	0.0455	0.0455	0.0455
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	6.42	0.0176	0.0176	0.0176
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	5.80	0.0159	0.0159	0.0159
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	14.17	0.0388	0.0388	0.0388
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	14.17	0.0388	0.0388	0.0388
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	14.17	0.0388	0.0388	0.0388
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	14.17	0.0388	0.0388	0.0388
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	14.17	0.0388	0.0388	0.0388
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	14.17	0.0388	0.0388	0.0388
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	2.16	0.0059	0.0059	0.0059
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	2.44	0.0067	0.0067	0.0067
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	1.68	0.0046	0.0046	0.0046
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	0.65	0.0018	0.0018	0.0018
PABCO Gypsum	30501520	0.0000	0.0000	2016 v.1	25	0.59	0.0016	0.0016	0.0016
Georgia Pacific	30501599	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Georgia Pacific	30501599	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Chemical Lime (Apex)	30501604	0.0000	0.0000	2016 v.1	25	296.28	0.8117	0.8117	0.8117
Chemical Lime (Apex)	30501604	0.0000	0.0000	2016 v.1	25	6.24	0.0171	0.0171	0.0171
Chemical Lime (Apex)	30501604	0.0000	0.0000	2016 v.1	25	119.39	0.3271	0.3271	0.3271
Chemical Lime (Apex)	30501604	0.0000	0.0000	2016 v.1	25	681.55	1.8673	1.8673	1.8673
Chemical Lime (Apex)	30501699	0.0000	0.0000	2016 v.1	25	4.68	0.0128	0.0128	0.0128
Republic DUMPCO (Apex)	30502503	0.0000	0.0000	2016 v.1	25	1.25	0.0034	0.0034	0.0034
Republic DUMPCO (Apex)	30502503	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Geneva Polymer Products	30502508	0.0000	0.0000	default value	25	0.66	0.0018	0.0018	0.0018
PABCO Gypsum	30502513	0.0000	0.0000	2016 v.1	25	4.78	0.0131	0.0131	0.0131
PABCO Gypsum	30502513	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Blue Diamond Hill Gypsum	30504001	0.0000	0.0000	default value	25	1.14	0.0031	0.0031	0.0031
Wells Cargo Lone Mountain	30504001	0.0000	0.0000	default value	25	0.11	0.0003	0.0003	0.0003
Brady Linen Services	30504033	0.0000	0.0000	2016 v.1	25	26.74	0.0733	0.0733	0.0733
J R Simplot Company	30504033	0.0000	0.0000	2016 v.1	25	127.12	0.3483	0.3483	0.3483
J R Simplot Company	30504099	0.0000	0.0000	2016 v.1	25	0.55	0.0015	0.0015	0.0015
Kinder Morgan	30600904	0.0000	0.0000	2016 v.1	25	0.03	0.0001	0.0001	0.0001
Clearwater Paper	30790003	-0.0012	0.0002	2016 v.1	25	33.83	0.0927	0.0920	0.0922
Clearwater Paper	30799998	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
Artesian Spas	30800724	0.0000	0.0000	default value	25	0.10	0.0003	0.0003	0.0003
LASCO Bathware	30800799	0.0000	0.0000	2016 v.1	25	1.59	0.0044	0.0044	0.0044
Metl Span	30800802	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
Univeral Urethane	30800802	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
Letica Corporation	30890022	0.0000	0.0000	default value	25	0.04	0.0001	0.0001	0.0001
Kern River (Dry Lake-Apex)	31000203	-0.0154	-0.0148	2016 v.1	25	21.79	0.0597	0.0542	0.0462
Las Vegas Paving - 5th Street	39001089	0.0000	0.0000	default value	25	1.00	0.0027	0.0027	0.0027
Shelby American	39990003	0.0000	0.0000	default value	25	0.18	0.0005	0.0005	0.0005
Wynn Las Vegas	40100103	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
Erickson International	40200101	0.0000	0.0000	default value	25	0.04	0.0001	0.0001	0.0001
Yesco	40200101	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
Manheim Nevada	40201001	0.0041	0.0013	2016 v.1	25	4.68	0.0128	0.0131	0.0133
MGM Grand/New York New York	40201101	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
Catalina Plastic and Coating	40201399	0.0000	0.0000	2016 v.1	25	2.34	0.0064	0.0064	0.0064
GE Transport	40201501	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000

Facility Name	SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	Summer (%)	2017 NEI tpy	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
Plasticard Locktech	40202201	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
Univeral Urethane	40202201	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
Preferred Laminations	40202501	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
Pro Terminal Operators	40400150	0.0000	0.0000	default value	25	0.07	0.0002	0.0002	0.0002
Lasfuel McCarran Tank Farm	40400153	0.0000	0.0000	default value	25	0.08	0.0002	0.0002	0.0002
CPP Acquisition	40500101	-0.0085	0.0009	2016 v.1	25	12.87	0.0353	0.0335	0.0338
CPP Acquisition	40500401	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
Las Vegas Color Graphics	40500411	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Las Vegas Review Journal	40500417	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Nevada Color Litho	40500433	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000
West Rock	40500501	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Berry Plastics Corporation	40500802	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000
Wynn Las Vegas	40600306	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
MGM Grand/New York New York	40600401	0.0000	0.0000	default value	25	0.00	0.0000	0.0000	0.0000
Brady Linen Services	41000130	0.0000	0.0000	2016 v.1	25	18.94	0.0519	0.0519	0.0519
CC Landfill Energy LLC	50100410	0.0000	0.0000	IPM	25	0.22	0.0006	0.0006	0.0006
Kurt Segler Water Reclamation	50100765	0.0000	0.0000	2016 v.1	25	0.00	0.0000	0.0000	0.0000
City of Las Vegas WPCF	50100789	0.0000	0.0000	2016 v.1	25	5.74	0.0157	0.0157	0.0157
City of Las Vegas WPCF	50100799	0.0000	0.0000	2016 v.1	25	13.05	0.0358	0.0358	0.0358
City of Las Vegas WPCF	50100799	0.0000	0.0000	2016 v.1	25	3.91	0.0107	0.0107	0.0107
Republic DUMPCO (Apex)	50200601	0.0000	0.0000	default value	25	0.48	0.0013	0.0013	0.0013
Republic Services (Sunrise)	50300601	0.0000	0.0000	default value	25	4.68	0.0128	0.0128	0.0128
Kinder Morgan	50410312	0.0000	0.0000	2016 v.1	25	0.23	0.0006	0.0006	0.0006
Total						**4120.62**	**12.34**	**11.41**	**11.33**

Table 10-3. Clark County Temporal Distribution of Nonpoint Emissions by SCC

SCC	DESCRIPTION	SUMMER (%)	DATA SOURCE	2011 MAINTENANCE PLAN WEEKDAY (%)
2102002000	Stationary Source Fuel Combustion: Industrial: Bituminous/Subbituminous Coal: Total: All Boiler Types	24.50%	EIA Table 6.2	71.40%
2102004001	Stationary Source Fuel Combustion: Industrial: Distillate Oil: All Boiler Types	21.29%	EIA Table 3.7b	71.40%
2102004002	Stationary Source Fuel Combustion: Industrial: Distillate Oil: All IC Engine Types	21.29%	EIA Table 3.7b	71.40%
2102005000	Stationary Source Fuel Combustion: Industrial: Residual Oil: Total: All Boiler Types	25.84%	EIA Table 3.7b	71.40%
2102006000	Stationary Source Fuel Combustion: Industrial: Natural Gas: Total: Boilers and IC Engines	25.15%	EIA Table 4.3	71.40%
2102007000	Stationary Source Fuel Combustion: Industrial: Liquified Petroleum Gas (LPG): Total: All Boiler Types	25.84%	EIA Table 3.7b	71.40%
2102008000	Stationary Source Fuel Combustion: Industrial: Wood: Total: All Boiler Types	25.28%	EIA Table 10.2b	71.40%
2102011000	Stationary Source Fuel Combustion: Industrial: Kerosene: Total: All Boiler Types	8.17%	EIA Table3.7b	71.40%
2103001000	Stationary Source Fuel Combustion: Commercial/Institutional: Anthracite Coal: Total: All Boiler Types	21.53%	EIA Table 6.2	71.40%
2103002000	Stationary Source Fuel Combustion: Commercial/Institutional: Bituminous/Subbituminous Coal: Total: All Boiler Types	14.88%	EIA Table 6.2	71.40%
2103004001	Stationary Source Fuel Combustion: Commercial/Institutional: Distillate Oil: Boilers	11.53%	EIA Table 3.7a	71.40%
2103004002	Stationary Source Fuel Combustion: Commercial/Institutional: Distillate Oil: IC Engines	11.53%	EIA Table 3.7a	71.40%

SCC	DESCRIPTION	SUMMER (%)	DATA SOURCE	2011 MAINTENANCE PLAN WEEKDAY (%)
2103005000	Stationary Source Fuel Combustion: Commercial/Institutional: Residual Oil: Total: All Boiler Types	11.58%	EIA Table 3.7a	71.40%
2103006000	Stationary Source Fuel Combustion: Commercial/Institutional: Natural Gas: Total: Boilers and IC Engines	12.61%	EIA Table 4.3	71.40%
2103007000	Stationary Source Fuel Combustion: Commercial/Institutional: Liquified Petroleum Gas (LPG): Total: All Combustor Types	25.00%	2011 Maintenance Plan/EPA	71.40%
2103008000	Stationary Source Fuel Combustion: Commercial/Institutional: Wood: Total: All Boiler Types	25.47%	EIA Table 10.2a	71.40%
2103011000	Stationary Source Fuel Combustion: Commercial/Institutional: Kerosene: Total: All Combustor Types	7.49%	EIA Table 3.7a	71.40%
2104004000	Stationary Source Fuel Combustion: Residential: Distillate Oil: Total: All Combustor Types	11.44%	EIA Table 3.7a	71.40%
2104006000	Stationary Source Fuel Combustion: Residential: Natural Gas: Total: All Combustor Types	7.16%	EIA Table 4.3	71.40%
2104007000	Stationary Source Fuel Combustion: Residential: Liquified Petroleum Gas (LPG): Total: All Combustor Types	25.00%	2011 Maintenance Plan/EPA	71.40%
2104008100	Stationary Source Fuel Combustion: Residential: Wood: Fireplace: general	0.00%	NOAA Heating Degree Days	0.00%
2104008210	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: fireplace inserts; non-EPA certified	0.00%	NOAA Heating Degree Days	0.00%
2104008220	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: fireplace inserts; EPA certified; non-catalytic	0.00%	NOAA Heating Degree Days	0.00%
2104008230	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: fireplace inserts; EPA certified; catalytic	0.00%	NOAA Heating Degree Days	0.00%

SCC	DESCRIPTION	SUMMER (%)	DATA SOURCE	2011 MAINTENANCE PLAN WEEKDAY (%)
2104008310	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: freestanding, non-EPA certified	0.00%	NOAA Heating Degree Days	0.00%
2104008320	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: freestanding, EPA certified, non-catalytic	0.00%	NOAA Heating Degree Days	0.00%
2104008330	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: freestanding, EPA certified, catalytic	0.00%	NOAA Heating Degree Days	0.00%
2104008400	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: pellet-fired, general (freestanding or FP insert)	0.00%	NOAA Heating Degree Days	0.00%
2104008510	Stationary Source Fuel Combustion: Residential: Wood: Furnace: Indoor, cordwood-fired, non-EPA certified	0.00%	NOAA Heating Degree Days	0.00%
2104008610	Stationary Source Fuel Combustion: Residential: Wood: Hydronic heater: outdoor	0.00%	NOAA Heating Degree Days	0.00%
2104008700	Stationary Source Fuel Combustion: Residential: Wood: Outdoor wood burning device, NEC (fire-pits, chimeas, etc)	0.00%	NOAA Heating Degree Days	0.00%
2104009000	Stationary Source Fuel Combustion: Residential: Firelog: Total: All Combustor Types	0.00%	NOAA Heating Degree Days	0.00%
2104011000	Stationary Source Fuel Combustion: Residential: Kerosene: Total: All Heater Types	7.51%	EIA Table 3.7a	71.40%
2302002100	Industrial Processes: Food and Kindred Products: SIC 20: Commercial Cooking - Charbroiling: Conveyorized Charbroiling	25.00%	2011 Maintenance Plan/EPA	71.40%
2302002200	Industrial Processes: Food and Kindred Products: SIC 20: Commercial Cooking - Charbroiling: Under-fired Charbroiling	25.00%	2011 Maintenance Plan/EPA	71.40%

SCC	DESCRIPTION	SUMMER (%)	DATA SOURCE	2011 MAINTENANCE PLAN WEEKDAY (%)
2302003000	Industrial Processes: Food and Kindred Products: SIC 20: Commercial Cooking - Frying: Deep Fat Frying	25.00%	2011 Maintenance Plan/EPA	71.40%
2302003100	Industrial Processes: Food and Kindred Products: SIC 20: Commercial Cooking - Frying: Flat Griddle Frying	25.00%	2011 Maintenance Plan/EPA	71.40%
2302003200	Industrial Processes: Food and Kindred Products: SIC 20: Commercial Cooking - Frying: Clamshell Griddle Frying	25.00%	2011 Maintenance Plan/EPA	71.40%
2401001000	Solvent Utilization: Surface Coating: Architectural Coatings: Total: All Solvent Types	28.10%	2011 Maintenance Plan/US Census Bureau	71.40%
2401005000	Solvent Utilization: Surface Coating: Auto Refinishing: SIC 7532: Total: All Solvent Types	25.00%	2011 Maintenance Plan/EPA	100.00%
2401008000	Solvent Utilization: Surface Coating: Traffic Markings: Total: All Solvent Types	25.00%	2011 Maintenance Plan/EPA	100.00%
2401015000	Solvent Utilization: Surface Coating: Factory Finished Wood: SIC 2426 thru 242: Total: All Solvent Types	25.70%	2011 Maintenance Plan/EPA	100.00%
2401020000	Solvent Utilization: Surface Coating: Wood Furniture: SIC 25: Total: All Solvent Types	25.20%	2011 Maintenance Plan/EPA	100.00%
2401025000	Solvent Utilization: Surface Coating: Metal Furniture: SIC 25: Total: All Solvent Types	25.00%	Default value	100.00%
2401030000	Solvent Utilization: Surface Coating: Paper: SIC 26: Total: All Solvent Types	25.20%	2011 Maintenance Plan/EPA	100.00%
2401055000	Solvent Utilization: Surface Coating: Machinery and Equipment: SIC 35: Total: All Solvent Types	25.20%	2011 Maintenance Plan/EPA	100.00%
2401065000	Solvent Utilization: Surface Coating: Electronic and Other Electrical: SIC 36 - 363: Total: All Solvent Types	25.00%	2011 Maintenance Plan/EPA	100.00%
2401070000	Solvent Utilization: Surface Coating: Motor Vehicles: SIC 371: Total: All Solvent Types	26.10%	2011 Maintenance Plan/EPA	100.00%
2401075000	Solvent Utilization: Surface Coating: Aircraft: SIC 372: Total: All Solvent Types	26.00%	2011 Maintenance Plan/EPA	100.00%

SCC	DESCRIPTION	SUMMER (%)	DATA SOURCE	2011 MAINTENANCE PLAN WEEKDAY (%)
2401090000	Solvent Utilization: Surface Coating: Miscellaneous Manufacturing: Total: All Solvent Types	25.40%	2011 Maintenance Plan/EPA	100.00%
2401100000	Solvent Utilization: Surface Coating: Industrial Maintenance Coatings: Total: All Solvent Types	25.40%	2011 Maintenance Plan/EPA	100.00%
2401200000	Solvent Utilization: Surface Coating: Other Special Purpose Coatings: Total: All Solvent Types	25.40%	2011 Maintenance Plan/EPA	100.00%
2415000000	Solvent Utilization: Degreasing: All Processes/All Industries: Total: All Solvent Types	25.20%	2011 Maintenance Plan/EPA	83.30%
2420000000	Solvent Utilization: Dry Cleaning: All Processes: Total: All Solvent Types	25.50%	2011 Maintenance Plan/EPA	100.00%
2425000000	Solvent Utilization: Graphic Arts: All Processes: Total: All Solvent Types	25.20%	2011 Maintenance Plan/EPA	75.00%
2460100000	Solvent Utilization: Miscellaneous Non-industrial: Consumer and Commercial: All Personal Care Products: Total: All Solvent Types	25.00%	2011 Maintenance Plan/EPA	71.40%
2460200000	Solvent Utilization: Miscellaneous Non-industrial: Consumer and Commercial: All Household Products: Total: All Solvent Types	25.00%	2011 Maintenance Plan/EPA	71.40%
2460400000	Solvent Utilization: Miscellaneous Non-industrial: Consumer and Commercial: All Automotive Aftermarket Products: Total: All Solvent Types	25.00%	2011 Maintenance Plan/EPA	71.40%
2460500000	Solvent Utilization: Miscellaneous Non-industrial: Consumer and Commercial: All Coatings and Related Products: Total: All Solvent Types	25.00%	2011 Maintenance Plan/EPA	71.40%
2460600000	Solvent Utilization: Miscellaneous Non-industrial: Consumer and Commercial: All Adhesives and Sealants: Total: All Solvent Types	25.00%	2011 Maintenance Plan/EPA	71.40%

SCC	DESCRIPTION	SUMMER (%)	DATA SOURCE	2011 MAINTENANCE PLAN WEEKDAY (%)
2460800000	Solvent Utilization: Miscellaneous Non-industrial: Consumer and Commercial: All FIFRA Related Products: Total: All Solvent Types	25.00%	2011 Maintenance Plan/EPA	71.40%
2460900000	Solvent Utilization: Miscellaneous Non-industrial: Consumer and Commercial: Miscellaneous Products (Not Otherwise Covered): Total: All Solvent Types	25.00%	2011 Maintenance Plan/EPA	71.40%
2461021000	Solvent Utilization: Miscellaneous Non-industrial: Commercial: Cutback Asphalt: Total: All Solvent Types	25.00%	2011 Maintenance Plan/EPA	71.40%
2461022000	Solvent Utilization: Miscellaneous Non-industrial: Commercial: Emulsified Asphalt: Total: All Solvent Types	25.00%	2011 Maintenance Plan/EPA	71.40%
2461850000	Solvent Utilization: Miscellaneous Non-industrial: Commercial: Pesticide Application: Agricultural: All Processes	25.00%	2011 Maintenance Plan/EPA	71.40%
2501011011	Storage and Transport: Petroleum and Petroleum Product Storage: Residential Portable Gas Cans: Permeation	74.30%	2011 Maintenance Plan/EPA	25.00%
2501011012	Storage and Transport: Petroleum and Petroleum Product Storage: Residential Portable Gas Cans: Evaporation (includes Diurnal losses)	57.90%	2011 Maintenance Plan/EPA	25.00%
2501011013	Storage and Transport: Petroleum and Petroleum Product Storage: Residential Portable Gas Cans: Spillage During Transport	40.40%	2011 Maintenance Plan/EPA	25.00%
2501011014	Storage and Transport: Petroleum and Petroleum Product Storage: Residential Portable Gas Cans: Refilling at the Pump - Vapor Displacement	57.90%	2011 Maintenance Plan/EPA	25.00%
2501011015	Storage and Transport: Petroleum and Petroleum Product Storage: Residential Portable Gas Cans: Refilling at the Pump - Spillage	40.40%	2011 Maintenance Plan/EPA	25.00%

SCC	DESCRIPTION	SUMMER (%)	DATA SOURCE	2011 MAINTENANCE PLAN WEEKDAY (%)
2501012011	Storage and Transport: Petroleum and Petroleum Product Storage: Commercial Portable Gas Cans: Permeation	69.80%	2011 Maintenance Plan/EPA	100.00%
2501012012	Storage and Transport: Petroleum and Petroleum Product Storage: Commercial Portable Gas Cans: Evaporation (includes Diurnal losses)	54.40%	2011 Maintenance Plan/EPA	100.00%
2501012013	Storage and Transport: Petroleum and Petroleum Product Storage: Commercial Portable Gas Cans: Spillage During Transport	38.00%	2011 Maintenance Plan/EPA	100.00%
2501012014	Storage and Transport: Petroleum and Petroleum Product Storage: Commercial Portable Gas Cans: Refilling at the Pump - Vapor Displacement	54.40%	2011 Maintenance Plan/EPA	100.00%
2501012015	Storage and Transport: Petroleum and Petroleum Product Storage: Commercial Portable Gas Cans: Refilling at the Pump - Spillage	38.00%	2011 Maintenance Plan/EPA	100.00%
2501050120	Storage and Transport: Petroleum and Petroleum Product Storage: Bulk Terminals: All Evaporative Losses: Gasoline	25.83%	EIA NV Finished Motor Gasoline Stocks	71.40%
2501055120	Storage and Transport: Petroleum and Petroleum Product Storage: Bulk Plants: All Evaporative Losses: Gasoline	25.83%	EIA NV Finished Motor Gasoline Stocks	71.40%
2501060051	Storage and Transport: Petroleum and Petroleum Product Storage: Gasoline Service Stations: Stage 1: Submerged Filling	25.00%	EIA West Coast Finished Motor Gasoline Supplied	71.40%
2501060052	Storage and Transport: Petroleum and Petroleum Product Storage: Gasoline Service Stations: Stage 1: Splash Filling	25.00%	EIA West Coast Finished Motor Gasoline Supplied	71.40%
2501060053	Storage and Transport: Petroleum and Petroleum Product Storage: Gasoline Service Stations: Stage 1: Balanced Submerged Filling	25.00%	EIA West Coast Finished Motor Gasoline Supplied	71.40%

SCC	DESCRIPTION	SUMMER (%)	DATA SOURCE	2011 MAINTENANCE PLAN WEEKDAY (%)
2501060201	Storage and Transport: Petroleum and Petroleum Product Storage: Gasoline Service Stations: Underground Tank: Breathing and Emptying	25.00%	EIA West Coast Finished Motor Gasoline Supplied	71.40%
2501080050	Storage and Transport: Petroleum and Petroleum Product Storage: Airports : Aviation Gasoline: Stage 1: Total	25.00%	Bureau of Transportation Statistics Airline Fuel Cost and Consumption	71.40%
2501080100	Storage and Transport: Petroleum and Petroleum Product Storage: Airports : Aviation Gasoline: Stage 2: Total	26.93%	Bureau of Transportation Statistics Airline Fuel Cost and Consumption	71.40%
2505030120	Storage and Transport: Petroleum and Petroleum Product Transport: Truck: Gasoline	25.83%	EIA West Coast Finished Motor Gasoline Supplied	71.40%
2505040120	Storage and Transport: Petroleum and Petroleum Product Transport: Pipeline: Gasoline	25.83%	EIA West Coast Finished Motor Gasoline Supplied	71.40%
2610000500	Waste Disposal, Treatment, and Recovery: Open Burning: All Categories: Land Clearing Debris (use 28-10-005-000 for Logging Debris Burning)	25.00%	2011 Maintenance Plan/EPA	71.40%
2610030000	Waste Disposal, Treatment, and Recovery: Open Burning: Residential: Household Waste (use 26-10-000-xxx for Yard Wastes)	25.00%	2011 Maintenance Plan/EPA	71.40%
2630020000	Waste Disposal, Treatment, and Recovery: Wastewater Treatment: Public Owned: Total Processed	25.00%	2011 Maintenance Plan/EPA	71.40%
2680003000	Waste Disposal, Treatment, and Recovery: Composting: 100% Green Waste (e.g., residential or municipal yard wastes): All Processes	25.00%	2011 Maintenance Plan/EPA	71.40%
2805002000	Miscellaneous Area Sources: Agriculture Production - Livestock: Beef cattle - finishing operations on pasture/range: Confinement	25.00%	Default value	71.4%

SCC	DESCRIPTION	SUMMER (%)	DATA SOURCE	2011 MAINTENANCE PLAN WEEKDAY (%)
2805007100	Miscellaneous Area Sources: Agriculture Production - Livestock: Poultry production - layers with dry manure management systems: Confinement	25.00%	Default value	71.4%
2805009100	Miscellaneous Area Sources: Agriculture Production - Livestock: Poultry production - broilers: Confinement	25.00%	Default value	71.4%
2805010100	Miscellaneous Area Sources: Agriculture Production - Livestock: Poultry production - turkeys: Confinement	25.00%	Default value	71.4%
2805018000	Miscellaneous Area Sources: Agriculture Production - Livestock: Dairy cattle composite: Not Elsewhere Classified	25.00%	Default value	71.4%
2805025000	Miscellaneous Area Sources: Agriculture Production - Livestock: Swine production composite: Not Elsewhere Classified (see also 28-05-039, -047, -053)	25.00%	Default value	71.4%
2805035000	Miscellaneous Area Sources: Agriculture Production - Livestock: Horses and Ponies Waste Emissions: Not Elsewhere Classified	25.00%	Default value	71.4%
2805040000	Miscellaneous Area Sources: Agriculture Production - Livestock: Sheep and Lambs Waste Emissions: Total	25.00%	Default value	71.4%
2805045000	Miscellaneous Area Sources: Agriculture Production - Livestock: Goats Waste Emissions: Not Elsewhere Classified	75.00%	Default value	71.4%
2810025000	Miscellaneous Area Sources: Other Combustion: Charcoal Grilling - Residential (see 23-02-002-xxx for Commercial): Total	25.00%	Default value	71.4%
2104008530	fireplace	0.00%	NOAA Heating Degree Days	0.00%
2104008620	fireplace	0.00%	NOAA Heating Degree Days	0.00%
2104008630	fireplace	0.00%	NOAA Heating Degree Days	0.00%

Table 10-4. SCC Categories in 2017 NEI Excluded from Nonpoint Source VOC Emission Projections

SCC	Description	Reason Excluded
2102002000	Stationary Source Fuel Combustion: Industrial: Bituminous/Subbituminous Coal: Total: All Boiler Types	Point Source Overlap
2102005000	Stationary Source Fuel Combustion: Industrial: Residual Oil: Total: All Boiler Types	2017 NEI 0 tpy
2102006000	Stationary Source Fuel Combustion: Industrial: Natural Gas: Total: Boilers and IC Engines	Point Source Overlap
2102007000	Stationary Source Fuel Combustion: Industrial: Liquified Petroleum Gas (LPG): Total: All Boiler Types	Point Source Overlap
2102011000	Stationary Source Fuel Combustion: Industrial: Kerosene: Total: All Boiler Types	2017 NEI 0 tpy
2103001000	Stationary Source Fuel Combustion: Commercial/Institutional: Anthracite Coal: Total: All Boiler Types	2017 NEI 0 tpy
2103002000	Stationary Source Fuel Combustion: Commercial/Institutional: Bituminous/Subbituminous Coal: Total: All Boiler Types	2017 NEI 0 tpy
2103005000	Stationary Source Fuel Combustion: Commercial/Institutional: Residual Oil: Total: All Boiler Types	2017 NEI 0 tpy
2103006000	Stationary Source Fuel Combustion: Commercial/Institutional: Natural Gas: Total: Boilers and IC Engines	Point Source Overlap
2104011000	Stationary Source Fuel Combustion: Residential: Kerosene: Total: All Heater Types	2017 NEI 0 tpy
2401030000	Solvent Utilization: Surface Coating: Paper: SIC 26: Total: All Solvent Types	2017 NEI 0 tpy
2501060052	Storage and Transport: Petroleum and Petroleum Product Storage: Gasoline Service Stations: Stage 1: Splash Filling	2017 NEI 0 tpy
2805009100	Miscellaneous Area Sources: Agriculture Production - Livestock: Poultry production - broilers: Confinement	2017 NEI 0 tpy
2805010100	Miscellaneous Area Sources: Agriculture Production - Livestock: Poultry production - turkeys: Confinement	2017 NEI 0 tpy
2104008530	fireplace	Summer 0 tpd
2104008620	fireplace	Summer 0 tpd
2104008630	fireplace	Summer 0 tpd

SCC	Description	Reason Excluded
2104008100	Stationary Source Fuel Combustion: Residential: Wood: Fireplace: general	Summer 0 tpd
2104008210	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: fireplace inserts; non-EPA certified	Summer 0 tpd
2104008220	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: fireplace inserts; EPA certified; non-catalytic	Summer 0 tpd
2104008230	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: fireplace inserts; EPA certified; catalytic	Summer 0 tpd
2104008310	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: freestanding, non-EPA certified	Summer 0 tpd
2104008320	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: freestanding, EPA certified, non-catalytic	Summer 0 tpd
2104008330	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: freestanding, EPA certified, catalytic	Summer 0 tpd
2104008400	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: pellet-fired, general (freestanding or FP insert)	Summer 0 tpd
2104008510	Stationary Source Fuel Combustion: Residential: Wood: Furnace: Indoor, cordwood-fired, non-EPA certified	Summer 0 tpd
2104008610	Stationary Source Fuel Combustion: Residential: Wood: Hydronic heater: outdoor	Summer 0 tpd
2104008700	Stationary Source Fuel Combustion: Residential: Wood: Outdoor wood burning device, NEC (fire-pits, chimeas, etc)	Summer 0 tpd
2104009000	Stationary Source Fuel Combustion: Residential: Firelog: Total: All Combustor Types	Summer 0 tpd

Table 10-5. Nonpoint Source VOC Summer Weekday Emissions Projections (tpd)

SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	2017 NEI (tpy)	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
2102004001	0.0220	0.0078	2016v.1	0.39	0.0009	0.0010	0.0013
2102004002	0.0220	0.0078	2016v.1	55.30	0.1290	0.1460	0.1848
2102008000	0.0068	0.0203	2016v.1	0.64	0.0018	0.0019	0.0022
2103004001	0.0219	-0.0034	2016v.1	0.01	0.0000	0.0000	0.0000
2103004002	0.0219	-0.0034	2016v.1	0.05	0.0001	0.0001	0.0001
2103007000	0.0000	0.0000	2016v.1	1.70	0.0047	0.0047	0.0047
2103008000	0.0000	0.0000	2016v.1	1.78	0.0050	0.0050	0.0049
2103011000	0.0000	0.0000	2016v.1	0.01	0.0000	0.0000	0.0000
2104004000	0.0000	0.0000	2016v.1	0.05	0.0001	0.0001	0.0001
2104006000	0.15538	0.014601	population	79.75	0.0625	0.1208	0.4837
2104007000	0.0000	0.0000	2016v.1	1.62	0.0044	0.0044	0.0044
2302002100	0.0147	0.0156	2016v.1	24.45	0.0938	0.1021	0.1180
2302002200	0.0147	0.0156	2016v.1	83.17	0.3190	0.3472	0.4014
2302003000	0.0159	0.0167	2016v.1	17.50	0.0671	0.0736	0.0859
2302003100	0.0121	0.0131	2016v.1	10.76	0.0413	0.0443	0.0501
2302003200	0.0129	0.0139	2016v.1	0.57	0.0022	0.0023	0.0027
2401001000	0.0148	0.0157	2016v.1	2601.39	8.0076	8.7186	8.9733
2401005000	0.0000	0.0000	2016v.1	356.38	1.3669	1.3669	1.3669
2401008000	0.0000	0.0000	2016v.1	366.31	1.4050	1.4050	1.4050
2401015000	0.0000	0.0000	2016v.1	11.67	0.0460	0.0460	0.0448
2401020000	0.0000	0.0000	2016v.1	75.91	0.2935	0.2935	0.2912
2401025000	0.0000	0.0000	2016v.1	64.59	0.2478	0.2478	0.2478
2401055000	0.0000	0.0000	2016v.1	4.96	0.0192	0.0192	0.0190
2401065000	0.0000	0.0000	2016v.1	4.06	0.0156	0.0156	0.0156
2401070000	0.0000	0.0000	2016v.1	21.00	0.0841	0.0841	0.0805
2401075000	0.0000	0.0000	2016v.1	0.26	0.0010	0.0010	0.0010
2401090000	0.0000	0.0000	2016v.1	65.79	0.2564	0.2564	0.2523
2401100000	0.0145	0.0154	2016v.1	401.73	1.5656	1.7021	1.9341
2401200000	0.0080	0.0090	2016v.1	6.48	0.0253	0.0265	0.0284
2415000000	0.0000	0.0000	2016v.1	735.10	2.3675	2.3675	2.3487
2420000000	0.0000	0.0000	2016v.1	12.97	0.0508	0.0508	0.0498
2425000000	0.0148	0.0157	2016v.1	1711.13	4.9618	5.4020	6.1997
2460100000	0.0148	0.0157	2016v.1	2158.78	5.9121	6.4369	7.4464
2460200000	0.0148	0.0156	2016v.1	2198.29	6.0203	6.5533	7.5786
2460400000	0.0148	0.0157	2016v.1	208.24	0.5703	0.6209	0.7183
2460500000	0.0148	0.0157	2016v.1	1046.94	2.8672	3.1217	3.6112

SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	2017 NEI (tpy)	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
2460600000	0.0148	0.0157	2016v.1	2010.13	5.5050	5.9937	6.9336
2460800000	0.0148	0.0157	2016v.1	1961.63	5.3722	5.8491	6.7665
2460900000	0.0148	0.0157	2016v.1	77.14	0.2113	0.2300	0.2661
2461021000	0.0000	0.0000	2016v.1	302.96	0.8297	0.8297	0.8297
2461022000	0.0000	0.0000	2016v.1	1225.95	3.3574	3.3574	3.3574
2461850000	0.0000	0.0000	2016v.1	3.46	0.0095	0.0095	0.0095
2501011011	0.0151	0.0160	2016v.1	50.39	0.1436	0.1566	0.0611
2501011012	0.0151	0.0160	2016v.1	56.54	0.1256	0.1369	0.0686
2501011013	0.0151	0.0160	2016v.1	113.50	0.1759	0.1918	0.1377
2501011014	0.0151	0.0160	2016v.1	23.31	0.0518	0.0565	0.0283
2501011015	0.0151	0.0160	2016v.1	3.36	0.0052	0.0057	0.0041
2501012011	0.0151	0.0160	2016v.1	2.20	0.0168	0.0184	0.0076
2501012012	0.0151	0.0160	2016v.1	1.81	0.0108	0.0117	0.0063
2501012013	0.0151	0.0160	2016v.1	154.84	0.6445	0.7030	0.5364
2501012014	0.0151	0.0160	2016v.1	67.14	0.4001	0.4364	0.2326
2501012015	0.0151	0.0160	2016v.1	6.46	0.0269	0.0293	0.0224
2501050120	-0.0143	-0.0281	2016v.1	470.51	1.3313	1.2172	0.8465
2501055120	-0.0143	-0.0281	2016v.1	0.10	0.0003	0.0003	0.0002
2501060051	-0.0143	-0.0251	2016v.1	2257.90	6.1836	5.6535	4.2328
2501060053	-0.0143	-0.0251	2016v.1	87.13	0.2386	0.2182	0.1633
2501060201	-0.0143	-0.0251	2016v.1	425.00	1.1639	1.0641	0.7967
2501080050	0.0000	0.0000	2016v.1	134.67	0.3688	0.3688	0.3688
2501080100	0.0000	0.0000	2016v.1	0.17	0.0005	0.0005	0.0005
2505030120	-0.0143	-0.0251	2016v.1	27.79	0.0786	0.0719	0.0521
2505040120	-0.0143	-0.0281	2016v.1	40.06	0.1134	0.1036	0.0721
2610000500	0.0000	0.0000	2016v.1	185.36	0.5076	0.5076	0.5076
2610030000	0.0000	0.0000	2016v.1	8.02	0.0220	0.0220	0.0220
2630020000	0.0153	0.0161	2016v.1	28.06	0.0769	0.0839	0.0974
2680003000	0.0000	0.0000	2016v.1	287.71	0.7879	0.7879	0.7879
2805002000	0.0030	-0.0057	2016v.1	12.11	0.0332	0.0338	0.0318
2805007100	0.0170	0.0122	2016v.1	0.04	0.0001	0.0001	0.0001
2805018000	0.0019	0.0006	2016v.1	0.21	0.0006	0.0006	0.0006
2805025000	0.0165	0.0054	2016v.1	0.04	0.0001	0.0001	0.0001
2805035000	0.0000	0.0000	2016v.1	2.14	0.0059	0.0059	0.0059
2805040000	-0.0006	0.0000	2016v.1	0.34	0.0009	0.0009	0.0009
2805045000	0.0000	0.0000	2016v.1	0.01	0.0001	0.0001	0.0000
2810025000	0.0154	0.0162	2016v.1	27.34	0.0749	0.0818	0.0951
TOTAL				**22982.49**	**64.69**	**67.83**	**71.31**

Table 10-6. SCC Categories in 2017 NEI Excluded from NO_x Nonpoint Emissions Projections

SCC	Description	Reason Excluded
2102001000	Stationary Source Fuel Combustion: Industrial: Anthracite Coal: Total: All Boiler Types	2017 NEI 0 tpy
2102002000	Stationary Source Fuel Combustion: Industrial: Bituminous/Subbituminous Coal: Total: All Boiler Types	Point Source Overlap
2102005000	Stationary Source Fuel Combustion: Industrial: Residual Oil: Total: All Boiler Types	2017 NEI 0 tpy
2102006000	Stationary Source Fuel Combustion: Industrial: Natural Gas: Total: Boilers and IC Engines	Point Source Overlap
2102011000	Stationary Source Fuel Combustion: Industrial: Kerosene: Total: All Boiler Types	2017 NEI 0 tpy
2103001000	Stationary Source Fuel Combustion: Commercial/Institutional: Anthracite Coal: Total: All Boiler Types	2017 NEI 0 tpy
2103002000	Stationary Source Fuel Combustion: Commercial/Institutional: Bituminous/Subbituminous Coal: Total: All Boiler Types	2017 NEI 0 tpy
2103005000	Stationary Source Fuel Combustion: Commercial/Institutional: Residual Oil: Total: All Boiler Types	2017 NEI 0 tpy
2104001000	Stationary Source Fuel Combustion: Commercial/Institutional: Kerosene: Total: All Combustor Types	2017 NEI 0 tpy
2104002000	Stationary Source Fuel Combustion: Residential: Distillate Oil: Total: All Combustor Types	2017 NEI 0 tpy
2104011000	Stationary Source Fuel Combustion: Residential: Kerosene: Total: All Heater Types	2017 NEI 0 tpy
2610000100	Waste Disposal, Treatment, and Recovery: Open Burning: All Categories: Yard Waste - Leaf Species Unspecified	2017 NEI 0 tpy
2610000400	Waste Disposal, Treatment, and Recovery: Open Burning: All Categories: Yard Waste - Brush Species Unspecified	2017 NEI 0 tpy
2104008530	fireplace	Summer 0 tpd
2104008620	fireplace	Summer 0 tpd
2104008630	fireplace	Summer 0 tpd
2104008100	Stationary Source Fuel Combustion: Residential: Wood: Fireplace: general	Summer 0 tpd
2104008210	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: fireplace inserts; non-EPA certified	Summer 0 tpd
2104008220	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: fireplace inserts; EPA certified; non-catalytic	Summer 0 tpd
2104008230	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: fireplace inserts; EPA certified; catalytic	Summer 0 tpd
2104008310	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: freestanding, non-EPA certified	Summer 0 tpd
2104008320	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: freestanding, EPA certified, non-catalytic	Summer 0 tpd

SCC	Description	Reason Excluded
2104008330	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: freestanding, EPA certified, catalytic	Summer 0 tpd
2104008400	Stationary Source Fuel Combustion: Residential: Wood: Woodstove: pellet-fired, general (freestanding or FP insert)	Summer 0 tpd
2104008510	Stationary Source Fuel Combustion: Residential: Wood: Furnace: Indoor, cordwood-fired, non-EPA certified	Summer 0 tpd
2104008610	Stationary Source Fuel Combustion: Residential: Wood: Hydronic heater: outdoor	Summer 0 tpd
2104008700	Stationary Source Fuel Combustion: Residential: Wood: Outdoor wood burning device, NEC (fire-pits, chimeas, etc)	Summer 0 tpd
2104009000	Stationary Source Fuel Combustion: Residential: Firelog: Total: All Combustor Types	Summer 0 tpd

Table 10-7. Nonpoint Source NO_x Summer Weekday Emissions Projections (tpd)

SCC	2016-2023 Annual GAF	2023-2028 Annual GAF	GAF Source	2017 NEI (tpy)	2017 Summer Weekday (tpd)	2023 Summer Weekday (tpd)	2033 Summer Weekday (tpd)
2102004001	0.0219531	0.0078294	2016v.1	39.50	0.0921	0.1043	0.1116
2102004002	0.0219531	0.0078294	2016v.1	795.25	1.8549	2.0992	2.2471
2102007000	-0.0632168	0.0036887	2016v.1	23.50	0.0667	0.0414	0.0428
2102008000	0.0068234	0.0203415	2016v.1	8.32	0.0230	0.0240	0.0284
2103004001	0.0218811	-0.0034378	2016v.1	0.42	0.0005	0.0006	0.0006
2103004002	0.0218811	-0.0034378	2016v.1	0.66	0.0008	0.0009	0.0009
2103006000	0.0003187	-0.0152856	2016v.1	759.97	1.0496	1.0516	0.9069
2103007000	0	0	2016v.1	46.47	0.1273	0.1273	0.1273
2103008000	0	0	2016v.1	23.08	0.0644	0.0644	0.0644
2103011000	0	0	2016v.1	0.31	0.0003	0.0003	0.0003
2104004000	0	0	2016v.1	1.32	0.0017	0.0017	0.0017
2104006000	0.0155378	0.0146008	Population	1363.05	1.0684	1.1680	1.3215
2104007000	0	0	2016v.1	41.53	0.1137	0.1137	0.1137
2610000500	0	-0.2	2016v.1	65.61	0.1797	0.1797	-0.1438
2610030000	0	-0.2	2016v.1	7.70	0.0211	0.0211	-0.0169
2810025000	0	-0.2	2016v.1	10.31	0.0282	0.0282	-0.0226
TOTAL				**3187.00**	**4.69**	**5.03**	**4.78**

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APPENDIX A-1

Emissions Summary for Proposed Federal Action

EMISSIONS SUMMARY FOR A PROPOSED

FEDERAL ACTION AT NORTH LAS VEGAS AIRPORT

AND

JEAN SPORT AVIATION CENTER,

CLARK COUNTY, NEVADA

DEPARTMENT OF AIR FORCE
July 26, 2021

A. EXECUTIVE SUMMARY

The Department of Air Force (DAF) is proposing to provide dedicated Contracted Close Air Support (CCAS) training for students at Nellis Air Force Base (AFB). The DAF proposed action involves flight and ground support operations at North Las Vegas Airport (NLV) and Jean Sport Aviation Center, and the aircraft would engage in training exercises in Special Use Airspace (SUA), mostly outside of Clark County. In addition, a cargo van or large pickup truck would transport armaments between NLV and Jean airport. Contractor personnel that would be based at NLV would live locally and would engage in vehicular commutes to and from work. No construction, demolition, or renovation activity is proposed.

For one of the aircraft being proposed, the Rockwell OV-10 (using the T76-G-12A engine), the total emissions from all related activities would exceed the *de minimis* threshold for NO_x under General Conformity regulations. [This is based on Clark County's maintenance designation for the 1997 ozone NAAQS (hydrographic area HA 212 and HA 164A, among others).]

Clark County is in the process of preparing its second Maintenance Plan for the 1997 ozone National Ambient Air Quality Standards (NAAQS). The County intends to include emissions from the DAF proposed action into the emissions budget as part of its submittal to the United States Environmental Protection Agency (USEPA). This document provides the results of the DAF emissions estimation, which could form the basis for the expanded emissions budget.

If the USEPA accepts Clark County's proposition to include emissions from the DAF proposed action the proposed action would be presumed to conform to the 1997 ozone Maintenance Plan.

B. BACKGROUND

The DAF is proposing to provide dedicated CCAS training for 6th Combat Training Squadron (6 CTS) Joint Terminal Attack Controller (JTAC) students at Nellis AFB. CCAS training scenarios would include the use of inert training ordnance on existing and approved targets following published delivery profiles and safety footprints. The Proposed Action includes elements affecting civil airports proposed for use and military training SUA. The elements affecting the airports proposed for use include CCAS aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the SUA include SUA use and use of defensive countermeasures and training munitions.

The proposed action includes aircraft landings & takeoffs at NLV and Jean Sport Aviation Center, touch-and-go operations at NLV, Aerospace Ground Equipment (AGE) use at both airports, employee commutes at NLV, aircraft refueling at NLV, and cargo transport of armaments between NLV and Jean airport. The proposed action is tentatively scheduled to begin on January 1, 2022, and end on December 31, 2031 (10 years).

Clark County is planning to submit to the USEPA its second Maintenance Plan for the 1997 O_3 NAAQS. The DAF requests the inclusion of emissions from the proposed action into the emissions budget that will be incorporated into the Maintenance Plan submittal. Additionally, Clark County intends to create a separate category for military aircraft operations (and related activity) from civilian airports. As such the emissions from the proposed action would be kept

separate from those of civilian aircraft operations at NLV and Jean airports, as well as military aircraft operations at Nellis AFB.

This document summarizes the activities associated with the DAF proposed action and presents an estimate of emissions under the worst-case scenario. This scenario involves using the Rockwell OV-10 for all aircraft operations.

C. DESCRIPTION OF PROPOSED ACTION

1. All aircraft operations are assumed to be performed by the Rockwell OV-10, using the T76-G-12A engine.
2. All aircraft refueling will occur at NLV. No refueling will occur at Jean Airport.
3. Trim tests prior to takeoff will occur at NLV and Jean airport.
4. Ground support equipment (AGE and Auxiliary Power Units) will be used at NLV and Jean airport.
5. After takeoff from NLV some aircraft will leave for training in the SUA (mostly) outside Clark County and some will leave for Jean airport.
6. A small portion of SUAs R-4806E and R-4806W are within the northern portions of Clark County. An even smaller portion of R-4806W is within hydrographic area HA 212.
7. A cargo vehicle, such as a van or large pickup truck, will transport defensive countermeasures and training munitions between NLV and Jean airport.
8. The flights from NLV destined for Jean airport will land at Jean airport, be loaded with the armaments, and depart for the SUA.
9. The cargo vehicle will return to NLV and depart again for Jean airport later in the day.
10. The aircraft that departed Jean airport for the SUA will return to the airport after their training and unload unused armaments. Following that, the aircraft will return to NLV.
11. The cargo vehicle will load the unused armaments at Jean airport and return to NLV.
12. Contractor employees will be based only at NLV, live locally, and engage in vehicular commutes to and from the airport during normal workdays (5 days/week, 52 week/year). No contract personnel will be based at Jean Airport.
13. No depot-level maintenance will occur at NLV or Jean airport. This includes corrosion control (aircraft/parts painting) and jet engine testing.

D. EMISSIONS ESTIMATION METHODOLOGY

The Air Force's Air Conformity Applicability Model (ACAM) was used to estimate emissions from the DAF proposed action. ACAM was used for the following activities:

1. Aircraft operations at each airfield below the mixing height of 3,000 ft above ground level. This includes trim tests prior to takeoff, taxi/idle out, takeoff, climb-out, approach, landing, and taxi/idle in. Touch-and-go operations are also included. The aircraft would depart the airport airspace immediately after climb out (unless they are touch-and go operations, which are assumed to be below 3,000 ft AGL and for which this analysis already includes the emissions). Any emissions after the climb out mode of operations are typically not associated with airport operations; rather, they are associated with transit activity (see Item 5, below).
2. Ground support equipment (AGE and Auxiliary Power Units).

3. Employee commutes to and from work (only applies at NLV).
4. Emissions from aircraft refueling and fuel storage (only applies at NLV). To be conservative, AVGAS is assumed to be the fuel that will be used by the aircraft.
5. Aircraft operations between NLV and Jean (Figure 1). The aircraft would fly between 7,500 and 8,500 ft AGL and will transit through the 2015 O_3 NAAQS nonattainment and 1997 O_3 NAAQS maintenance areas. As the mixing height in Clark County is 10,000 ft AGL, emissions from transit flights are accounted for with the following assumptions:
    a. Of the flights departing for and returning from Jean Airport 50% of the takeoffs and landings at NLV will be to/from the Northeast, creating a longer flight path within the 2015 O_3 NAAQS nonattainment area.
    b. A 15% longer flight path is assumed for those 50% of operations.
    c. The remainder of the 50% of flights between NLV and Jean are assumed to take off and land to/from the Southwest and operate on a shorter flight path.
6. Aircraft operations between each airport and the various Special Use Airspaces (Figure 1) are accounted for in the same way as aircraft operations between NLV and Jean (Item 5, above). The operations are as follows:
    a. Flights from NLV to R-4806 E/W and back
    b. Flights from NLV to the Nevada-California border on their way to R-2502 A/E/N and back
    c. Flights from Jean Airport to the Nevada-California border on their way to R-2502 A/E/N and back
7. Emissions from the cargo transport of defensive countermeasures and training munitions between NLV and Jean airport were estimated using emission factors for Heavy-Duty Gasoline or Diesel Trucks.
8. Emissions in the SUA R-4806W within hydrographic area HA 212 are considered to be negligible. For example, NO_x emissions in the entire SUA are estimated at 0.69 tons/year. Because the portion of R-4806W within HA 212 is estimated to be less than 10% of the total SUA area, the estimated NO_x emissions are estimated at less than 0.069 tons/year.

Flights from each airport are assumed to climb out of the airport airspace and attain cruising altitude as safely as possible and in the amount of time consistent with the aircraft manufacturer's recommendations. Based on Air Force guidance, emissions during the cruising (transit) phase of the flight are estimated using the power settings for the climb out phase of operations. As such, the emissions for each flight are estimated using the relevant emission factors for the following algorithms:

Aircraft Emissions per Mode for LTOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

Aircraft Emissions for LTOs per Year

$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{LTO}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

Aircraft Emissions per Mode for TGOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

Aircraft Emissions for TGOs per Year

$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{TGO}: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

Aircraft Emissions per Mode for Trim Tests per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

Aircraft Emissions for Trim Tests per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

Aircraft Emissions per Mode for Transit Operations per Year

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * $AEM_{CLIMBOUT}$ / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
2000: Conversion Factor pounds to TONs

Emissions for the transit phase are estimated using the climb out power settings. The transit phase is conservatively defined as starting at the centroid of the airport. [This will result in some overlap between the "true" climb out and "true" transit.] As such, the methodology properly estimates emissions from flight operations in **all** the airspace where the aircraft operate (i.e., between ground level and the cruising altitude of between 7,500 AGL and 8,500 ft AGL).

E. EMISSIONS SUMMARY

Emissions from the DAF proposed action are shown in Tables 1 and 2.

TABLE 1
EMISSIONS FROM THE DAF PROPOSED ACTION (TON/YEAR)

Activity	VOC	NOx	CO	SOx	PM-10	PM-2.5
NLV Operations & Commutes	13.487	63.145	19.85	1.677	1.685	1.612
Jean Operations	6.673	62.954	19.095	1.66	1.675	1.603
Cargo Transportation	0.013	0.012	0.142	0	0	0
NLV-Jean-NLV Transit	0.008	0.701	0.418	0.076	0.045	0.04
NLV to R-4806	0.001	0.107	0.064	0.012	0.007	0.006
NLV to R-2502 (NV-CA border)	0.007	0.598	0.356	0.065	0.038	0.034
Jean to R-2502 (NV-CA border)	0.003	0.224	0.133	0.024	0.014	0.013
T O T A L	**20.192**	**127.741**	**40.058**	**3.514**	**3.464**	**3.308**

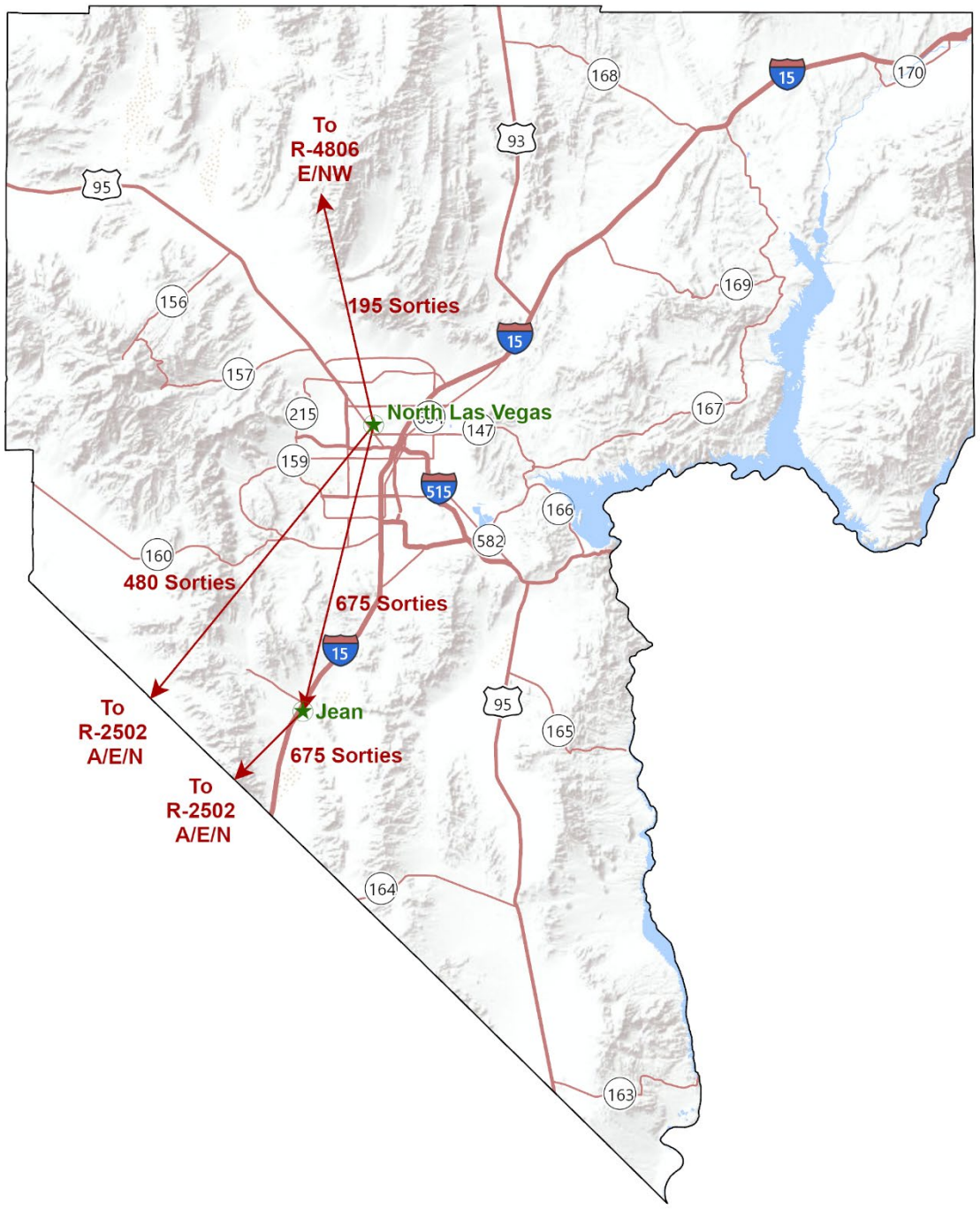
TABLE 2
EMISSIONS FROM THE DAF PROPOSED ACTION (TON/SUMMER WEEKDAY)

Activity	VOC	NOx	CO	SOx	PM-10	PM-2.5
NLV Operations & Commutes	0.05	0.24	0.08	0.01	0.01	0.01
Jean Operations	0.03	0.24	0.07	0.01	0.01	0.01
Cargo Transportation	5.E-05	5.E-05	5.E-04	0	0	0
NLV-Jean-NLV Transit	3.E-05	3.E-03	2.E-03	3.E-04	2.E-04	2.E-04
NLV to R-4806	4.E-06	4.E-04	2.E-04	5.E-05	3.E-05	2.E-05
NLV to R-2502 (NV-CA border)	3.E-05	2.E-03	1.E-03	3.E-04	1.E-04	1.E-04
Jean to R-2502 (NV-CA border)	1.E-05	9.E-04	5.E-04	9.E-05	5.E-05	5.E-05
T O T A L	**0.08**	**0.49**	**0.15**	**0.01**	**0.01**	**0.01**

NOTES:
CCAS operations are expected to occur year-round and only during weekdays, with no seasonal variations
Summer Season weekday emissions are expected to be the same as average (annual) weekday emissions
Average annual weekday emissions = Emissions Tons/year ÷ 52 weeks/year ÷ 5 days/week

Appendix A contains the ACAM summary and detailed reports. The detailed report outlines the algorithms and assumptions and contains information on the constants and numeric conversions.

FIGURE 1: CLARK COUNTY MAP WITH PROPOSED CCAS FLIGHT OPERATIONS



APPENDIX A

ACAM SUMMARY & DETAILED REPORTS

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

North Las Vegas Airport Operations

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Las Vegas, NV; Clark Co, NV

b. Action Title: Nellis AFB Contracted Close Air Support (CCAS)

c. Project Number/s (if applicable): N/A

d. Projected Action Start Date: 1 / 2022

e. Action Description:

The Air Force is proposing to provide dedicated CCAS training for 6 CTS JTAC students at Nellis AFB to enhance professional expertise and optimize training opportunities and efficiencies in order to meet combatant commander deployment requirements. CCAS training scenarios would include the use of inert training ordnance used on existing and approved targets following published delivery profiles and safety footprints. The Proposed Action includes elements affecting civil airports proposed for use and military training Special Use Airspace (SUA). The elements affecting the airports proposed for use include CCAS aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the SUA include SUA use and use of inert training ordnance.

f. Point of Contact:

Name: Rahul Chettri
Title: Contractor
Organization: Versar
Email: rchettri@versar.com
Phone Number: (757) 557-0810

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Las Vegas, NV			
VOC	13.487		
NOx	63.145		
CO	19.850	100	No
SOx	1.677		

PM 10	1.685		
PM 2.5	1.612		
Pb	0.000		
NH3	0.003		
CO2e	3232.8		
Las Vegas, NV			
VOC	13.487	100	No
NOx	63.145	100	No
CO	19.850		
SOx	1.677		
PM 10	1.685		
PM 2.5	1.612		
Pb	0.000		
NH3	0.003		
CO2e	3232.8		
Las Vegas, NV			
VOC	13.487	100	No
NOx	63.145	100	No
CO	19.850		
SOx	1.677		
PM 10	1.685		
PM 2.5	1.612		
Pb	0.000		
NH3	0.003		
CO2e	3232.8		
Clark Co, NV			
VOC	13.487		
NOx	63.145		
CO	19.850		
SOx	1.677		
PM 10	1.685	100	No
PM 2.5	1.612		
Pb	0.000		
NH3	0.003		
CO2e	3232.8		

2023 – (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Las Vegas, NV			
VOC	13.487		
NOx	63.145		
CO	19.850	100	No
SOx	1.677		
PM 10	1.685		
PM 2.5	1.612		
Pb	0.000		
NH3	0.003		
CO2e	3232.8		
Las Vegas, NV			
VOC	13.487	100	No
NOx	63.145	100	No
CO	19.850		
SOx	1.677		

PM 10	1.685		
PM 2.5	1.612		
Pb	0.000		
NH3	0.003		
CO2e	3232.8		
Las Vegas, NV			
VOC	13.487	100	No
NOx	63.145	100	No
CO	19.850		
SOx	1.677		
PM 10	1.685		
PM 2.5	1.612		
Pb	0.000		
NH3	0.003		
CO2e	3232.8		
Clark Co, NV			
VOC	13.487		
NOx	63.145		
CO	19.850		
SOx	1.677		
PM 10	1.685	100	No
PM 2.5	1.612		
Pb	0.000		
NH3	0.003		
CO2e	3232.8		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

North Las Vegas Airport Operations

1. General Information

- Action Location

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Las Vegas, NV; Clark Co, NV

- Action Title: Nellis AFB Contracted Close Air Support (CCAS)

- Project Number/s (if applicable): N/A

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:

Currently, the Air Force cannot self-generate the required amount of aircraft support to meet JTAC Qualification Course (JTACQC) production requirements, reduce current backlogs, or meet staffing requirements in operational units. This proposed action will address this shortfall. The purpose of the CCAS Proposed Action is to provide dedicated CCAS sorties from a civil airport to provide sustained JTACQC for 6th Combat Training Squadron (6 CTS) students. Dedicated CCAS would allow JTACQC support to Nellis AFB and improve and expand training to meet production requirements and support unit readiness.

- Action Description:

The Air Force is proposing to provide dedicated CCAS training for 6 CTS JTAC students at Nellis AFB to enhance professional expertise and optimize training opportunities and efficiencies in order to meet combatant commander deployment requirements. CCAS training scenarios would include the use of inert training ordnance used on existing and approved targets following published delivery profiles and safety footprints. The Proposed Action includes elements affecting civil airports proposed for use and military training Special Use Airspace (SUA). The elements affecting the airports proposed for use include CCAS aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the SUA include SUA use and use of inert training ordnance.

- Point of Contact

Name: Rahul Chettri
Title: Contractor
Organization: Versar
Email: rchettri@versar.com
Phone Number: (757) 557-0810

- Activity List:

Activity Type		Activity Title
2.	Aircraft	VGT Airfield - CCAS: Rockwell OV-10
3.	Personnel	VGT Airfield - CCAS Rockwell OV-10
4.	Tanks	VGT Airfield - CCAS: Rockwell OV-10 Fuel Storage & Refueling

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV; Las Vegas, NV; Las Vegas, NV

- Activity Title: VGT Airfield - CCAS: Rockwell OV-10

- Activity Description:
Aircraft/Engine Configuration: Rockwell OV-10 (T76-G-12A engine)
Includes AGE and TGOs (203 approx)

- Activity Start Date
Start Month: 1
Start Year: 2022

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	66.802406
SO_x	16.765781
NO_x	630.970807
CO	192.627298
PM 10	16.838587

Pollutant	Total Emissions (TONs)
PM 2.5	16.113654
Pb	0.000000
NH_3	0.000000
CO_2e	31765.6

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Total Emissions (TONs)
VOC	20.998396
SO_x	4.196665
NO_x	31.981540
CO	72.899797
PM 10	1.802651

Pollutant	Total Emissions (TONs)
PM 2.5	1.622386
Pb	0.000000
NH_3	0.000000
CO_2e	12684.1

- Activity Emissions [Aerospace Ground Equipment (AGE) part]:

Pollutant	Total Emissions (TONs)
VOC	45.804010
SO_x	12.569115
NO_x	598.989267
CO	119.727501
PM 10	15.035936

Pollutant	Total Emissions (TONs)
PM 2.5	14.491268
Pb	0.000000
NH_3	0.000000
CO_2e	19081.5

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: OV-10A
Engine Model: T76-G-12A
Primary Function: General - Turboprop

Aircraft has After burn: No
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	397.00	8.51	1.07	7.40	23.80	0.38	0.34	3234
Approach	476.00	0.92	1.07	8.50	17.20	0.50	0.45	3234
Intermediate	794.00	0.12	1.07	9.90	5.90	0.63	0.57	3234
Military	857.00	0.12	1.07	10.30	2.30	0.71	0.64	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 6
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 1350
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 203
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: Yes

- Flight Operations TIMs (Time In Mode)
Taxi/Idle Out [Idle] (mins): 19 (default)
Takeoff [Military] (mins): 0.5 (default)
Takeoff [After Burn] (mins): 0 (default)
Climb Out [Intermediate] (mins): 2.5 (default)
Approach [Approach] (mins): 4.5 (default)
Taxi/Idle In [Idle] (mins): 7 (default)

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 12 (default)
Approach (mins): 27 (default)
Intermediate (mins): 9 (default)
Military (mins): 12 (default)
AfterBurn (mins): 0 (default)

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)

TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{LTO}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for TGOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{TGO}: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

2.4 Auxiliary Power Unit (APU)

2.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

2.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

2.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

2.5 Aerospace Ground Equipment (AGE)

2.5.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 1350

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	10	No	Air Compressor	MC-1A - 18.4hp
1	1	No	Air Conditioner	MA-3D - 120hp
1	11	No	Generator Set	A/M32A-86D
1	1	No	Heater	H1
1	3	No	Hydraulic Test Stand	MJ-2A
1	10	No	Light Cart	NF-2

1	0.25	No	Start Cart	A/M32A-60A

2.5.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068	24.8
MA-3D - 120hp	7.1	0.053	0.050	4.167	0.317	0.109	0.105	161.7
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089	147.0
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006	8.9
MJ-2A	0.0	0.190	0.238	3.850	2.460	0.083	0.076	172.0
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010	22.1
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205	221.1

2.5.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year

$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

3. Personnel

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV; Las Vegas, NV; Las Vegas, NV

- Activity Title: VGT Airfield - CCAS Rockwell OV-10

- Activity Description:
Personnel: Support Contractor (25 persons)

- Activity Start Date
Start Month: 1
Start Year: 2022

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.539809

Pollutant	Total Emissions (TONs)
PM 2.5	0.010791

SO_x	0.003764
NO_x	0.475107
CO	5.872710
PM 10	0.012305

Pb	0.000000
NH_3	0.034597
CO_2e	562.4

3.2 Personnel Assumptions

- Number of Personnel

Active Duty Personnel: 0
Civilian Personnel: 0
Support Contractor Personnel: 25
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: Yes

- Average Personnel Round Trip Commute (mile): 20 (default)

- Personnel Work Schedule

Active Duty Personnel: 5 Days Per Week (default)
Civilian Personnel: 5 Days Per Week (default)
Support Contractor Personnel: 5 Days Per Week (default)
Air National Guard (ANG) Personnel: 4 Days Per Week (default)
Reserve Personnel: 4 Days Per Month (default)

3.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

3.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.282	000.002	000.217	003.152	000.007	000.006		000.023	00333.001
LDGT	000.353	000.003	000.387	004.397	000.009	000.008		000.024	00429.124
HDGV	000.778	000.005	001.126	016.414	000.020	000.018		000.045	00792.406
LDDV	000.104	000.003	000.137	002.597	000.004	000.004		000.008	00323.890
LDDT	000.248	000.004	000.397	004.475	000.007	000.006		000.008	00459.539
HDDV	000.483	000.013	005.163	001.750	000.175	000.161		000.028	01528.139
MC	003.015	000.003	000.828	013.258	000.027	000.023		000.053	00395.795

3.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year

$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year

$VMT_{Total} = VMT_{AD} + VMT_{C} + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_{C}: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4. Tanks

4.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV; Las Vegas, NV; Las Vegas, NV

- Activity Title: VGT Airfield - CCAS: Rockwell OV-10 Fuel Storage & Refueling

- Activity Description:
AVGAS Storage & Refueling

- Activity Start Date
Start Month: 1
Start Year: 2022

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	67.526794
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Total Emissions (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

4.2 Tanks Assumptions

- Chemical

Chemical Name:	Gasoline (RVP 7)
Chemical Category:	Petroleum Distillates
Chemical Density:	5.6
Vapor Molecular Weight (lb/lb-mole):	68
Stock Vapor Density (lb/ft^3):	0.0394277661309437
Vapor Pressure:	3.2
Vapor Space Expansion Factor (dimensionless):	0.068

- Tank

Type of Tank:	Vertical Tank
Tank Height (ft):	24
Tank Diameter (ft):	12
Annual Net Throughput (gallon/year):	327797

4.3 Tank Formula(s)

- Vapor Space Volume

$VSV = (PI / 4) * D^2 * H / 2$

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
H: Tank Height (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor

$VVSF = 1 / (1 + (0.053 * VP * H / 2))$

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
H: Tank Height (ft)

- Standing Storage Loss per Year

$SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000$

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year

$NT = (7.48 * ANT) / ((PI / 4.0) * D * H)$

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
H: Tank Height (ft)

- Working Loss Turnover (Saturation) Factor per Year

$WLSF = (18 + NT) / (6 * NT)$

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year

$WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000$

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput
WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

Jean Airport Operations

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Las Vegas, NV; Clark Co, NV

b. Action Title: Nellis AFB Contracted Close Air Support (CCAS)

c. Project Number/s (if applicable): N/A

d. Projected Action Start Date: 1 / 2022

e. Action Description:

The Air Force is proposing to provide dedicated CCAS training for 6 CTS JTAC students at Nellis AFB to enhance professional expertise and optimize training opportunities and efficiencies in order to meet combatant commander deployment requirements. CCAS training scenarios would include the use of inert training ordnance used on existing and approved targets following published delivery profiles and safety footprints. The Proposed Action includes elements affecting civil airports proposed for use and military training Special Use Airspace (SUA). The elements affecting the airports proposed for use include CCAS aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the SUA include SUA use and use of inert training ordnance.

f. Point of Contact:

Name: Rahul Chettri
Title: Contractor
Organization: Versar
Email: rchettri@versar.com
Phone Number: (757) 557-0810

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Las Vegas, NV			
VOC	6.673		
NOx	62.954		
CO	19.095	100	No
SOx	1.660		

PM 10	1.675		
PM 2.5	1.603		
Pb	0.000		
NH3	0.000		
CO2e	3126.7		
Las Vegas, NV			
VOC	6.673	100	No
NOx	62.954	100	No
CO	19.095		
SOx	1.660		
PM 10	1.675		
PM 2.5	1.603		
Pb	0.000		
NH3	0.000		
CO2e	3126.7		
Las Vegas, NV			
VOC	6.673	100	No
NOx	62.954	100	No
CO	19.095		
SOx	1.660		
PM 10	1.675		
PM 2.5	1.603		
Pb	0.000		
NH3	0.000		
CO2e	3126.7		
Clark Co, NV			
VOC	6.673		
NOx	62.954		
CO	19.095		
SOx	1.660		
PM 10	1.675	100	No
PM 2.5	1.603		
Pb	0.000		
NH3	0.000		
CO2e	3126.7		

2023 – (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Las Vegas, NV			
VOC	6.673		
NOx	62.954		
CO	19.095	100	No
SOx	1.660		
PM 10	1.675		
PM 2.5	1.603		
Pb	0.000		
NH3	0.000		
CO2e	3126.7		
Las Vegas, NV			
VOC	6.673	100	No
NOx	62.954	100	No
CO	19.095		
SOx	1.660		

PM 10	1.675		
PM 2.5	1.603		
Pb	0.000		
NH3	0.000		
CO2e	3126.7		
Las Vegas, NV			
VOC	6.673	100	No
NOx	62.954	100	No
CO	19.095		
SOx	1.660		
PM 10	1.675		
PM 2.5	1.603		
Pb	0.000		
NH3	0.000		
CO2e	3126.7		
Clark Co, NV			
VOC	6.673		
NOx	62.954		
CO	19.095		
SOx	1.660		
PM 10	1.675	100	No
PM 2.5	1.603		
Pb	0.000		
NH3	0.000		
CO2e	3126.7		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Jean Airport Operations

1. General Information

- Action Location

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Las Vegas, NV; Clark Co, NV

- Action Title: Nellis AFB Contracted Close Air Support (CCAS)

- Project Number/s (if applicable): N/A

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:

Currently, the Air Force cannot self-generate the required amount of aircraft support to meet JTAC Qualification Course (JTACQC) production requirements, reduce current backlogs, or meet staffing requirements in operational units. This proposed action will address this shortfall. The purpose of the CCAS Proposed Action is to provide dedicated CCAS sorties from a civil airport to provide sustained JTACQC for 6th Combat Training Squadron (6 CTS) students. Dedicated CCAS would allow JTACQC support to Nellis AFB and improve and expand training to meet production requirements and support unit readiness.

- Action Description:

The Air Force is proposing to provide dedicated CCAS training for 6 CTS JTAC students at Nellis AFB to enhance professional expertise and optimize training opportunities and efficiencies in order to meet combatant commander deployment requirements. CCAS training scenarios would include the use of inert training ordnance used on existing and approved targets following published delivery profiles and safety footprints. The Proposed Action includes elements affecting civil airports proposed for use and military training Special Use Airspace (SUA). The elements affecting the airports proposed for use include CCAS aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the SUA include SUA use and use of inert training ordnance.

- Point of Contact

Name: Rahul Chettri
Title: Contractor
Organization: Versar
Email: rchettri@versar.com
Phone Number: (757) 557-0810

- Activity List:

Activity Type		Activity Title
2.	Aircraft	Jean Airfield - CCAS Rockwell OV-10

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV; Las Vegas, NV; Las Vegas, NV

- Activity Title: Jean Airfield - CCAS Rockwell OV-10

- Activity Description:
Aircraft/Engine Configuration; Rockwell OV-10 (T76-G-12A engine)
Include AGE but not TGOs as it is a stopping point for weapons loading only.

- Activity Start Date
Start Month: 1
Start Year: 2022

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	66.726342
SO_x	16.600864
NO_x	629.540603
CO	190.951214
PM 10	16.749748

Pollutant	Total Emissions (TONs)
PM 2.5	16.033699
Pb	0.000000
NH_3	0.000000
CO_2e	31267.2

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Total Emissions (TONs)
VOC	20.922332
SO_x	4.031749
NO_x	30.551336
CO	71.223713
PM 10	1.713812

Pollutant	Total Emissions (TONs)
PM 2.5	1.542431
Pb	0.000000
NH_3	0.000000
CO_2e	12185.7

- Activity Emissions [Aerospace Ground Equipment (AGE) part]:

Pollutant	Total Emissions (TONs)
VOC	45.804010
SO_x	12.569115
NO_x	598.989267
CO	119.727501
PM 10	15.035936

Pollutant	Total Emissions (TONs)
PM 2.5	14.491268
Pb	0.000000
NH_3	0.000000
CO_2e	19081.5

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: OV-10A
Engine Model: T76-G-12A
Primary Function: General - Turboprop
Aircraft has After burn: No
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	397.00	8.51	1.07	7.40	23.80	0.38	0.34	3234
Approach	476.00	0.92	1.07	8.50	17.20	0.50	0.45	3234
Intermediate	794.00	0.12	1.07	9.90	5.90	0.63	0.57	3234
Military	857.00	0.12	1.07	10.30	2.30	0.71	0.64	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 6
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 1350
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 12

- Default Settings Used: Yes

- Flight Operations TIMs (Time In Mode)
Taxi/Idle Out [Idle] (mins): 19 (default)
Takeoff [Military] (mins): 0.5 (default)
Takeoff [After Burn] (mins): 0 (default)
Climb Out [Intermediate] (mins): 2.5 (default)
Approach [Approach] (mins): 4.5 (default)
Taxi/Idle In [Idle] (mins): 7 (default)

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 12 (default)
Approach (mins): 27 (default)
Intermediate (mins): 9 (default)
Military (mins): 12 (default)
AfterBurn (mins): 0 (default)

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{LTO}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for TGOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{TGO}: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)

$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

2.4 Auxiliary Power Unit (APU)

2.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

2.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

2.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

2.5 Aerospace Ground Equipment (AGE)

2.5.1 Aerospace Ground Equipment (AGE) Assumptions

- Default Settings Used: Yes

- AGE Usage
Number of Annual LTO (Landing and Take-off) cycles for AGE: 1350

- Aerospace Ground Equipment (AGE) (default)

Total Number of AGE	Operation Hours for Each LTO	Exempt Source?	AGE Type	Designation
1	10	No	Air Compressor	MC-1A - 18.4hp
1	1	No	Air Conditioner	MA-3D - 120hp
1	11	No	Generator Set	A/M32A-86D
1	1	No	Heater	H1
1	3	No	Hydraulic Test Stand	MJ-2A
1	10	No	Light Cart	NF-2
1	0.25	No	Start Cart	A/M32A-60A

2.5.2 Aerospace Ground Equipment (AGE) Emission Factor(s)

- Aerospace Ground Equipment (AGE) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
MC-1A - 18.4hp	1.1	0.267	0.008	0.419	0.267	0.071	0.068	24.8
MA-3D - 120hp	7.1	0.053	0.050	4.167	0.317	0.109	0.105	161.7
A/M32A-86D	6.5	0.294	0.046	6.102	0.457	0.091	0.089	147.0
H1	0.4	0.100	0.011	0.160	0.180	0.006	0.006	8.9
MJ-2A	0.0	0.190	0.238	3.850	2.460	0.083	0.076	172.0
NF-2	0.0	0.010	0.043	0.110	0.080	0.010	0.010	22.1
A/M32A-60A	0.0	0.270	0.306	1.820	5.480	0.211	0.205	221.1

2.5.3 Aerospace Ground Equipment (AGE) Formula(s)

- Aerospace Ground Equipment (AGE) Emissions per Year

$AGE_{POL} = AGE * OH * LTO * EF_{POL} / 2000$

AGE_{POL}: Aerospace Ground Equipment (AGE) Emissions per Pollutant (TONs)
AGE: Total Number of Aerospace Ground Equipment
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

Cargo Transportation

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV

b. Action Title: Nellis AFB CCAS: Munitions Transport

c. Project Number/s (if applicable): N/A

d. Projected Action Start Date: 1 / 2022

e. Action Description:

The CCAS aircraft will take off from North Las Vegas Airport and land at the nearby Jean Airport. A vehicle (truck or cargo van) will transport the armaments from NLV to Jean, where the aircraft will be armed. The aircraft will fly to the SUA for training, while the vehicle will return to NLV. Once the aircraft complete their training they will return to Jean for de-arming. The vehicle will travel back from NLV to Jean to load up unused ammunition and other gear and return to NLV. The aircraft will depart Jean and return to NLV.

This analysis ONLY addresses the activity involving transport of the armaments (primarily bullets and BDU-33s) between the two airports. The aircraft operations, ground suport equiment, refueling, etc. arre analyzed in a separate ACAM assessment. This is because AFCEC recommended modifying the Fleet Mix to account for Heavy-Duty Gasoline or Diesel Vehicles (HDGV/HDDV) that will be "commuting" between NLV to Jean and back. Modifying the fleet mix will apply across the board and will affect true commuter trip emissions. Moreover, the typical commuter roundtrip distance is much lower than the roundtrip distance these cargo vehicles will be traveling.

f. Point of Contact:

Name: Rahul Chettri
Title: Contractor
Organization: Versar, Inc.
Email: rchettri@versar.com
Phone Number: (757) 557-0810

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Conformity Analysis Summary:

2022

Pollutant		GENERAL CONFORMITY

	Action Emissions (ton/yr)	Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	0.013		
NOx	0.012		
CO	0.142		
SOx	0.000		
PM 10	0.000	100	No
PM 2.5	0.000		
Pb	0.000		
NH3	0.001		
CO2e	13.6		
Las Vegas, NV			
VOC	0.013	100	No
NOx	0.012	100	No
CO	0.142		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.001		
CO2e	13.6		
Las Vegas, NV			
VOC	0.013	100	No
NOx	0.012	100	No
CO	0.142		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.001		
CO2e	13.6		
Las Vegas, NV			
VOC	0.013		
NOx	0.012		
CO	0.142	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.001		
CO2e	13.6		

2023 – (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	0.013		
NOx	0.012		
CO	0.142		
SOx	0.000		
PM 10	0.000	100	No
PM 2.5	0.000		
Pb	0.000		

NH3	0.001		
CO2e	13.6		
Las Vegas, NV			
VOC	0.013	100	No
NOx	0.012	100	No
CO	0.142		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.001		
CO2e	13.6		
Las Vegas, NV			
VOC	0.013	100	No
NOx	0.012	100	No
CO	0.142		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.001		
CO2e	13.6		
Las Vegas, NV			
VOC	0.013		
NOx	0.012		
CO	0.142	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.001		
CO2e	13.6		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Cargo Transportation

1. General Information

- Action Location

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV

- Action Title: Nellis AFB CCAS: Munitions Transport

- Project Number/s (if applicable): N/A

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:

This activity supports a Contracted Close Air Support (CCAS) Aircraft proposed action at regional airports to support training at Nellis AFB.

- Action Description:

The CCAS aircraft will take off from North Las Vegas Airport and land at the nearby Jean Airport. A vehicle (truck or cargo van) will transport the armaments from NLV to Jean, where the aircraft will be armed. The aircraft will fly to the SUA for training, while the vehicle will return to NLV. Once the aircraft complete their training they will return to Jean for de-arming. The vehicle will travel back from NLV to Jean to load up unused ammunition and other gear, and return to NLV. The aircraft will depart Jean and return to NLV.

This analysis ONLY addresses the activity involving transport of the armaments (primarily bullets and BDU-33s) between the two airports. The aircraft operations, ground suport equiment, refueling, etc. arre analyzed in a separate ACAM assessment. This is because AFCEC recommended modifying the Fleet Mix to account for Heavy-Duty Gasoline or Diesel Vehicles (HDGV/HDDV) that will be "commuting" between NLV to Jean and back. Modifying the fleet mix will apply across the board and will affect true commuter trip emissions. Moreover, the typical commuter roundtrip distance is much lower than the roundtrip distance these cargo vehicles will be traveling.

- Point of Contact

Name: Rahul Chettri
Title: Contractor
Organization: Versar, Inc.
Email: rchettri@versar.com
Phone Number: (757) 557-0810

- Activity List:

Activity Type		Activity Title
2.	Personnel	Nellis AFB CCAS: Munitions Transport

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Personnel

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV; Las Vegas, NV; Las Vegas, NV

- Activity Title: Nellis AFB CCAS: Munitions Transport

- Activity Description:
Transport of armaments between North Las Vegas and Jean Airports

- Activity Start Date
Start Month: 1
Start Year: 2022

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.130796
SO_x	0.000912
NO_x	0.115118
CO	1.422958
PM 10	0.002982

Pollutant	Total Emissions (TONs)
PM 2.5	0.002615
Pb	0.000000
NH_3	0.008383
CO_2e	136.3

2.2 Personnel Assumptions

- Number of Personnel
Active Duty Personnel: 0
Civilian Personnel: 1
Support Contractor Personnel: 0
Air National Guard (ANG) Personnel: 0
Reserve Personnel: 0

- Default Settings Used: No

- Average Personnel Round Trip Commute (mile): 121.15

- Personnel Work Schedule
Active Duty Personnel: 5 Days Per Week
Civilian Personnel: 5 Days Per Week
Support Contractor Personnel: 5 Days Per Week
Air National Guard (ANG) Personnel: 4 Days Per Week
Reserve Personnel: 4 Days Per Month

2.3 Personnel On Road Vehicle Mixture

- On Road Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	37.55	60.32	0	0.03	0.2	0	1.9
GOVs	54.49	37.73	4.67	0	0	3.11	0

2.4 Personnel Emission Factor(s)

- On Road Vehicle Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.282	000.002	000.217	003.152	000.007	000.006		000.023	00333.001
LDGT	000.353	000.003	000.387	004.397	000.009	000.008		000.024	00429.124
HDGV	000.778	000.005	001.126	016.414	000.020	000.018		000.045	00792.406
LDDV	000.104	000.003	000.137	002.597	000.004	000.004		000.008	00323.890
LDDT	000.248	000.004	000.397	004.475	000.007	000.006		000.008	00459.539
HDDV	000.483	000.013	005.163	001.750	000.175	000.161		000.028	01528.139
MC	003.015	000.003	000.828	013.258	000.027	000.023		000.053	00395.795

2.5 Personnel Formula(s)

- Personnel Vehicle Miles Travel for Work Days per Year

$VMT_P = NP * WD * AC$

VMT_P: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

- Total Vehicle Miles Travel per Year

$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

VMT_{Total}: Total Vehicle Miles Travel (miles)
VMT_{AD}: Active Duty Personnel Vehicle Miles Travel (miles)
VMT_C: Civilian Personnel Vehicle Miles Travel (miles)
VMT_{SC}: Support Contractor Personnel Vehicle Miles Travel (miles)
VMT_{ANG}: Air National Guard Personnel Vehicle Miles Travel (miles)
VMT_{AFRC}: Reserve Personnel Vehicle Miles Travel (miles)

- Vehicle Emissions per Year

$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{Total}: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

NLV-Jean-NLV Transit

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV

b. Action Title: Nellis AFB Contracted Close Air Support (CCAS)

c. Project Number/s (if applicable): N/A

d. Projected Action Start Date: 1 / 2022

e. Action Description:

The Air Force is proposing to provide dedicated CCAS training for 6 CTS JTAC students at Nellis AFB to enhance professional expertise and optimize training opportunities and efficiencies in order to meet combatant commander deployment requirements. CCAS training scenarios would include the use of inert training ordnance used on existing and approved targets following published delivery profiles and safety footprints. The Proposed Action includes elements affecting civil airports proposed for use and military training Special Use Airspace (SUA). The elements affecting the airports proposed for use include CCAS aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the SUA include SUA use and use of inert training ordnance.

f. Point of Contact:

Name: Rahul Chettri
Title: Contractor
Organization: Versar
Email: rchettri@versar.com
Phone Number: (757) 557-0810

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	0.008		
NOx	0.701		
CO	0.418		
SOx	0.076		

PM 10	0.045	100	No
PM 2.5	0.040		
Pb	0.000		
NH3	0.000		
CO2e	229.0		
Las Vegas, NV			
VOC	0.008	100	No
NOx	0.701	100	No
CO	0.418		
SOx	0.076		
PM 10	0.045		
PM 2.5	0.040		
Pb	0.000		
NH3	0.000		
CO2e	229.0		
Las Vegas, NV			
VOC	0.008	100	No
NOx	0.701	100	No
CO	0.418		
SOx	0.076		
PM 10	0.045		
PM 2.5	0.040		
Pb	0.000		
NH3	0.000		
CO2e	229.0		
Las Vegas, NV			
VOC	0.008		
NOx	0.701		
CO	0.418	100	No
SOx	0.076		
PM 10	0.045		
PM 2.5	0.040		
Pb	0.000		
NH3	0.000		
CO2e	229.0		

2023 – (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	0.008		
NOx	0.701		
CO	0.418		
SOx	0.076		
PM 10	0.045	100	No
PM 2.5	0.040		
Pb	0.000		
NH3	0.000		
CO2e	229.0		
Las Vegas, NV			
VOC	0.008	100	No
NOx	0.701	100	No
CO	0.418		
SOx	0.076		

PM 10	0.045		
PM 2.5	0.040		
Pb	0.000		
NH3	0.000		
CO2e	229.0		
Las Vegas, NV			
VOC	0.008	100	No
NOx	0.701	100	No
CO	0.418		
SOx	0.076		
PM 10	0.045		
PM 2.5	0.040		
Pb	0.000		
NH3	0.000		
CO2e	229.0		
Las Vegas, NV			
VOC	0.008		
NOx	0.701		
CO	0.418	100	No
SOx	0.076		
PM 10	0.045		
PM 2.5	0.040		
Pb	0.000		
NH3	0.000		
CO2e	229.0		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

NLV-Jean-NLV Transit

1. General Information

- Action Location

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV

- Action Title: Nellis AFB Contracted Close Air Support (CCAS)

- Project Number/s (if applicable): N/A

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:

Currently, the Air Force cannot self-generate the required amount of aircraft support to meet JTAC Qualification Course (JTACQC) production requirements, reduce current backlogs, or meet staffing requirements in operational units. This proposed action will address this shortfall. The purpose of the CCAS Proposed Action is to provide dedicated CCAS sorties from a civil airport to provide sustained JTACQC for 6th Combat Training Squadron (6 CTS) students. Dedicated CCAS would allow JTACQC support to Nellis AFB and improve and expand training to meet production requirements and support unit readiness.

- Action Description:

The Air Force is proposing to provide dedicated CCAS training for 6 CTS JTAC students at Nellis AFB to enhance professional expertise and optimize training opportunities and efficiencies in order to meet combatant commander deployment requirements. CCAS training scenarios would include the use of inert training ordnance used on existing and approved targets following published delivery profiles and safety footprints. The Proposed Action includes elements affecting civil airports proposed for use and military training Special Use Airspace (SUA). The elements affecting the airports proposed for use include CCAS aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the SUA include SUA use and use of inert training ordnance.

- Point of Contact

Name: Rahul Chettri
Title: Contractor
Organization: Versar
Email: rchettri@versar.com
Phone Number: (757) 557-0810

- Activity List:

Activity Type		Activity Title
2.	Aircraft	VGT to Jean to VGT - CCAS: Rockwell OV-10 [LTO in NE Direction]
3.	Aircraft	VGT to Jean to VGT - CCAS: Rockwell OV-10 [LTO in SW Direction]

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV; Las Vegas, NV; Las Vegas, NV

- Activity Title: VGT to Jean to VGT - CCAS: Rockwell OV-10 [LTO in NE Direction]

- Activity Description:
Aircraft/Engine Configuration: Rockwell OV-10 (T76-G-12A engine)
338 LTO Cycles from VGT to Jean and back takeoff/land to/from NE direction

- Activity Start Date
Start Month: 1
Start Year: 2022

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.043568
SO_x	0.405371
NO_x	3.750633
CO	2.235226
PM 10	0.238677

Pollutant	Total Emissions (TONs)
PM 2.5	0.214809
Pb	0.000000
NH_3	0.000000
CO_2e	1225.2

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Total Emissions (TONs)
VOC	0.043568
SO_x	0.405371
NO_x	3.750633
CO	2.235226
PM 10	0.238677

Pollutant	Total Emissions (TONs)
PM 2.5	0.214809
Pb	0.000000
NH_3	0.000000
CO_2e	1225.2

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: OV-10A
Engine Model: T76-G-12A
Primary Function: General - Turboprop
Aircraft has After burn: No
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	397.00	8.51	1.07	7.40	23.80	0.38	0.34	3234
Approach	476.00	0.92	1.07	8.50	17.20	0.50	0.45	3234
Intermediate	794.00	0.12	1.07	9.90	5.90	0.63	0.57	3234
Military	857.00	0.12	1.07	10.30	2.30	0.71	0.64	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 6
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 338
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins): 0
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0
Climb Out [Intermediate] (mins): 8.47
Approach [Approach] (mins): 0
Taxi/Idle In [Idle] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{LTO}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for TGOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{TGO}: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

2.4 Auxiliary Power Unit (APU)

2.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: No

- Auxiliary Power Unit (APU)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

2.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

2.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV; Las Vegas, NV; Las Vegas, NV

- Activity Title: VGT to Jean to VGT - CCAS: Rockwell OV-10 [LTO in SW Direction]

- Activity Description:
Aircraft/Engine Configuration: Rockwell OV-10 (T76-G-12A engine)
338 LTO Cycles from VGT to Jean and back takeoff/land to/from SW direction

- Activity Start Date
Start Month: 1
Start Year: 2022

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.037858
SO_x	0.352247
NO_x	3.259110
CO	1.942298
PM 10	0.207398

Pollutant	Total Emissions (TONs)
PM 2.5	0.186658
Pb	0.000000
NH_3	0.000000
CO_2e	1064.6

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Total Emissions (TONs)
VOC	0.037858
SO_x	0.352247
NO_x	3.259110
CO	1.942298
PM 10	0.207398

Pollutant	Total Emissions (TONs)
PM 2.5	0.186658
Pb	0.000000
NH_3	0.000000
CO_2e	1064.6

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: OV-10A
Engine Model: T76-G-12A
Primary Function: General - Turboprop
Aircraft has After burn: No
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	397.00	8.51	1.07	7.40	23.80	0.38	0.34	3234
Approach	476.00	0.92	1.07	8.50	17.20	0.50	0.45	3234
Intermediate	794.00	0.12	1.07	9.90	5.90	0.63	0.57	3234
Military	857.00	0.12	1.07	10.30	2.30	0.71	0.64	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 6
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 338
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)
Taxi/Idle Out [Idle] (mins): 0

Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0
Climb Out [Intermediate] (mins): 7.36
Approach [Approach] (mins): 0
Taxi/Idle In [Idle] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test
Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year
$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{LTO}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for TGOs per Year
$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{TGO}: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

3.4 Auxiliary Power Unit (APU)

3.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: Yes

- Auxiliary Power Unit (APU) (default)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

3.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

3.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units

OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

NLV to R-4806 Transit

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:

Base: NELLIS AFB
State: Nevada
County(s): Clark; Lincoln; Nye
Regulatory Area(s): Clark Co, NV; Las Vegas, NV

b. Action Title: Nellis AFB Contracted Close Air Support (CCAS)

c. Project Number/s (if applicable): N/A

d. Projected Action Start Date: 1 / 2022

e. Action Description:

The Air Force is proposing to provide dedicated CCAS training for 6 CTS JTAC students at Nellis AFB to enhance professional expertise and optimize training opportunities and efficiencies in order to meet combatant commander deployment requirements. CCAS training scenarios would include the use of inert training ordnance used on existing and approved targets following published delivery profiles and safety footprints. The Proposed Action includes elements affecting civil airports proposed for use and military training Special Use Airspace (SUA). The elements affecting the airports proposed for use include CCAS aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the SUA include SUA use and use of inert training ordnance.

f. Point of Contact:

Name: Rahul Chettri
Title: Contractor
Organization: Versar
Email: rchettri@versar.com
Phone Number: (757) 557-0810

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	0.001		
NOx	0.107		
CO	0.064		
SOx	0.012		

PM 10	0.007	100	No
PM 2.5	0.006		
Pb	0.000		
NH3	0.000		
CO2e	34.8		
Las Vegas, NV			
VOC	0.001	100	No
NOx	0.107	100	No
CO	0.064		
SOx	0.012		
PM 10	0.007		
PM 2.5	0.006		
Pb	0.000		
NH3	0.000		
CO2e	34.8		
Las Vegas, NV			
VOC	0.001	100	No
NOx	0.107	100	No
CO	0.064		
SOx	0.012		
PM 10	0.007		
PM 2.5	0.006		
Pb	0.000		
NH3	0.000		
CO2e	34.8		
Las Vegas, NV			
VOC	0.001		
NOx	0.107		
CO	0.064	100	No
SOx	0.012		
PM 10	0.007		
PM 2.5	0.006		
Pb	0.000		
NH3	0.000		
CO2e	34.8		

2023

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	0.001		
NOx	0.107		
CO	0.064		
SOx	0.012		
PM 10	0.007	100	No
PM 2.5	0.006		
Pb	0.000		
NH3	0.000		
CO2e	34.8		
Las Vegas, NV			
VOC	0.001	100	No
NOx	0.107	100	No
CO	0.064		
SOx	0.012		

PM 10	0.007		
PM 2.5	0.006		
Pb	0.000		
NH3	0.000		
CO2e	34.8		
Las Vegas, NV			
VOC	0.001	100	No
NOx	0.107	100	No
CO	0.064		
SOx	0.012		
PM 10	0.007		
PM 2.5	0.006		
Pb	0.000		
NH3	0.000		
CO2e	34.8		
Las Vegas, NV			
VOC	0.001		
NOx	0.107		
CO	0.064	100	No
SOx	0.012		
PM 10	0.007		
PM 2.5	0.006		
Pb	0.000		
NH3	0.000		
CO2e	34.8		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

NLV to R-4806 Transit

1. General Information

- Action Location

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV

- Action Title: Nellis AFB Contracted Close Air Support (CCAS)

- Project Number/s (if applicable): N/A

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:

Currently, the Air Force cannot self-generate the required amount of aircraft support to meet JTAC Qualification Course (JTACQC) production requirements, reduce current backlogs, or meet staffing requirements in operational units. This proposed action will address this shortfall. The purpose of the CCAS Proposed Action is to provide dedicated CCAS sorties from a civil airport to provide sustained JTACQC for 6th Combat Training Squadron (6 CTS) students. Dedicated CCAS would allow JTACQC support to Nellis AFB and improve and expand training to meet production requirements and support unit readiness.

- Action Description:

The Air Force is proposing to provide dedicated CCAS training for 6 CTS JTAC students at Nellis AFB to enhance professional expertise and optimize training opportunities and efficiencies in order to meet combatant commander deployment requirements. CCAS training scenarios would include the use of inert training ordnance used on existing and approved targets following published delivery profiles and safety footprints. The Proposed Action includes elements affecting civil airports proposed for use and military training Special Use Airspace (SUA). The elements affecting the airports proposed for use include CCAS aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the SUA include SUA use and use of inert training ordnance.

- Point of Contact

Name: Rahul Chettri
Title: Contractor
Organization: Versar
Email: rchettri@versar.com
Phone Number: (757) 557-0810

- Activity List:

Activity Type		Activity Title
2.	Aircraft	VGT to R-4806 - CCAS: Rockwell OV-10 [LTO in NE Direction]
3.	Aircraft	VGT to R-4806 and back - CCAS: Rockwell OV-10 [LTO in SW Direction]

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV; Las Vegas, NV; Las Vegas, NV

- Activity Title: VGT to R-4806 - CCAS: Rockwell OV-10 [LTO in NE Direction]

- Activity Description:
Aircraft/Engine Configuration: Rockwell OV-10 (T76-G-12A engine)
98 LTO Cycles from VGT to R-4806 and back takeoff/land to/from NE direction

- Activity Start Date
Start Month: 1
Start Year: 2022

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.005757
SO_x	0.053563
NO_x	0.495585
CO	0.295348
PM 10	0.031537

Pollutant	Total Emissions (TONs)
PM 2.5	0.028383
Pb	0.000000
NH_3	0.000000
CO_2e	161.9

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Total Emissions (TONs)
VOC	0.005757
SO_x	0.053563
NO_x	0.495585
CO	0.295348
PM 10	0.031537

Pollutant	Total Emissions (TONs)
PM 2.5	0.028383
Pb	0.000000
NH_3	0.000000
CO_2e	161.9

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: OV-10A
Engine Model: T76-G-12A
Primary Function: General - Turboprop
Aircraft has After burn: No
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	397.00	8.51	1.07	7.40	23.80	0.38	0.34	3234
Approach	476.00	0.92	1.07	8.50	17.20	0.50	0.45	3234
Intermediate	794.00	0.12	1.07	9.90	5.90	0.63	0.57	3234
Military	857.00	0.12	1.07	10.30	2.30	0.71	0.64	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 6
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 98
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins): 0
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0
Climb Out [Intermediate] (mins): 3.86
Approach [Approach] (mins): 0
Taxi/Idle In [Idle] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{LTO}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for TGOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{TGO}: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

2.4 Auxiliary Power Unit (APU)

2.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: No

- Auxiliary Power Unit (APU)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

2.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

2.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year

$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV; Las Vegas, NV; Las Vegas, NV

- Activity Title: VGT to R-4806 and back - CCAS: Rockwell OV-10 [LTO in SW Direction]

- Activity Description:
Aircraft/Engine Configuration: Rockwell OV-10 (T76-G-12A engine)
98 LTO Cycles from VGT to R-4806 and back takeoff/land to/from SW direction

- Activity Start Date
Start Month: 1
Start Year: 2022

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.006622
SO_x	0.061612
NO_x	0.570051
CO	0.339727
PM 10	0.036276

Pollutant	Total Emissions (TONs)
PM 2.5	0.032648
Pb	0.000000
NH_3	0.000000
CO_2e	186.2

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Total Emissions (TONs)
VOC	0.006622
SO_x	0.061612
NO_x	0.570051
CO	0.339727
PM 10	0.036276

Pollutant	Total Emissions (TONs)
PM 2.5	0.032648
Pb	0.000000
NH_3	0.000000
CO_2e	186.2

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: OV-10A
Engine Model: T76-G-12A
Primary Function: General - Turboprop
Aircraft has After burn: No
Number of Engines: 2

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	397.00	8.51	1.07	7.40	23.80	0.38	0.34	3234
Approach	476.00	0.92	1.07	8.50	17.20	0.50	0.45	3234
Intermediate	794.00	0.12	1.07	9.90	5.90	0.63	0.57	3234
Military	857.00	0.12	1.07	10.30	2.30	0.71	0.64	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 6
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 98
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins):	0
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0
Climb Out [Intermediate] (mins):	4.44
Approach [Approach] (mins):	0
Taxi/Idle In [Idle] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{LTO}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for TGOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year
$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{TGO}: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

3.4 Auxiliary Power Unit (APU)

3.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: No

- Auxiliary Power Unit (APU)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

3.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

3.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)

APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

NLV to R-2502 Transit

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV

b. Action Title: Nellis AFB Contracted Close Air Support (CCAS)

c. Project Number/s (if applicable): N/A

d. Projected Action Start Date: 1 / 2022

e. Action Description:

The Air Force is proposing to provide dedicated CCAS training for 6 CTS JTAC students at Nellis AFB to enhance professional expertise and optimize training opportunities and efficiencies in order to meet combatant commander deployment requirements. CCAS training scenarios would include the use of inert training ordnance used on existing and approved targets following published delivery profiles and safety footprints. The Proposed Action includes elements affecting civil airports proposed for use and military training Special Use Airspace (SUA). The elements affecting the airports proposed for use include CCAS aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the SUA include SUA use and use of inert training ordnance.

f. Point of Contact:

Name: Rahul Chettri
Title: Contractor
Organization: Versar
Email: rchettri@versar.com
Phone Number: (757) 557-0810

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	0.007		
NOx	0.598		
CO	0.356		
SOx	0.065		

PM 10	0.038	100	No
PM 2.5	0.034		
Pb	0.000		
NH3	0.000		
CO2e	195.3		
Las Vegas, NV			
VOC	0.007	100	No
NOx	0.598	100	No
CO	0.356		
SOx	0.065		
PM 10	0.038		
PM 2.5	0.034		
Pb	0.000		
NH3	0.000		
CO2e	195.3		
Las Vegas, NV			
VOC	0.007	100	No
NOx	0.598	100	No
CO	0.356		
SOx	0.065		
PM 10	0.038		
PM 2.5	0.034		
Pb	0.000		
NH3	0.000		
CO2e	195.3		
Las Vegas, NV			
VOC	0.007		
NOx	0.598		
CO	0.356	100	No
SOx	0.065		
PM 10	0.038		
PM 2.5	0.034		
Pb	0.000		
NH3	0.000		
CO2e	195.3		

2023 – (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	0.007		
NOx	0.598		
CO	0.356		
SOx	0.065		
PM 10	0.038	100	No
PM 2.5	0.034		
Pb	0.000		
NH3	0.000		
CO2e	195.3		
Las Vegas, NV			
VOC	0.007	100	No
NOx	0.598	100	No
CO	0.356		
SOx	0.065		

PM 10	0.038		
PM 2.5	0.034		
Pb	0.000		
NH3	0.000		
CO2e	195.3		
Las Vegas, NV			
VOC	0.007	100	No
NOx	0.598	100	No
CO	0.356		
SOx	0.065		
PM 10	0.038		
PM 2.5	0.034		
Pb	0.000		
NH3	0.000		
CO2e	195.3		
Las Vegas, NV			
VOC	0.007		
NOx	0.598		
CO	0.356	100	No
SOx	0.065		
PM 10	0.038		
PM 2.5	0.034		
Pb	0.000		
NH3	0.000		
CO2e	195.3		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

NLV to R-2502 Transit

1. General Information

- Action Location

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV

- Action Title: Nellis AFB Contracted Close Air Support (CCAS)

- Project Number/s (if applicable): N/A

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:

Currently, the Air Force cannot self-generate the required amount of aircraft support to meet JTAC Qualification Course (JTACQC) production requirements, reduce current backlogs, or meet staffing requirements in operational units. This proposed action will address this shortfall. The purpose of the CCAS Proposed Action is to provide dedicated CCAS sorties from a civil airport to provide sustained JTACQC for 6th Combat Training Squadron (6 CTS) students. Dedicated CCAS would allow JTACQC support to Nellis AFB and improve and expand training to meet production requirements and support unit readiness.

- Action Description:

The Air Force is proposing to provide dedicated CCAS training for 6 CTS JTAC students at Nellis AFB to enhance professional expertise and optimize training opportunities and efficiencies in order to meet combatant commander deployment requirements. CCAS training scenarios would include the use of inert training ordnance used on existing and approved targets following published delivery profiles and safety footprints. The Proposed Action includes elements affecting civil airports proposed for use and military training Special Use Airspace (SUA). The elements affecting the airports proposed for use include CCAS aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the SUA include SUA use and use of inert training ordnance.

- Point of Contact

Name: Rahul Chettri
Title: Contractor
Organization: Versar
Email: rchettri@versar.com
Phone Number: (757) 557-0810

- Activity List:

Activity Type		Activity Title
2.	Aircraft	VGT to R-2502 - CCAS: Rockwell OV-10 [LTO in SW Direction]
3.	Aircraft	VGT to R-2502 and back - CCAS: Rockwell OV-10 [LTO in NE Direction]

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV; Las Vegas, NV; Las Vegas, NV

- Activity Title: VGT to R-2502 - CCAS: Rockwell OV-10 [LTO in SW Direction]

- Activity Description:
Aircraft/Engine Configuration: Rockwell OV-10 (T76-G-12A engine)
240 LTO Cycles from VGT to R-2502 and back takeoff/land to/from SW direction
Only covers flight operations within Clark County (i.e., to NV-CA border)

- Activity Start Date
Start Month: 1
Start Year: 2022

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.032287
SO_x	0.300411
NO_x	2.779508
CO	1.656475
PM 10	0.176878

Pollutant	Total Emissions (TONs)
PM 2.5	0.159190
Pb	0.000000
NH_3	0.000000
CO_2e	908.0

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Total Emissions (TONs)
VOC	0.032287
SO_x	0.300411
NO_x	2.779508
CO	1.656475
PM 10	0.176878

Pollutant	Total Emissions (TONs)
PM 2.5	0.159190
Pb	0.000000
NH_3	0.000000
CO_2e	908.0

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: OV-10A
Engine Model: T76-G-12A
Primary Function: General - Turboprop
Aircraft has After burn: No
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	397.00	8.51	1.07	7.40	23.80	0.38	0.34	3234
Approach	476.00	0.92	1.07	8.50	17.20	0.50	0.45	3234
Intermediate	794.00	0.12	1.07	9.90	5.90	0.63	0.57	3234
Military	857.00	0.12	1.07	10.30	2.30	0.71	0.64	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 6
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 240
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins): 0
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0
Climb Out [Intermediate] (mins): 8.84
Approach [Approach] (mins): 0
Taxi/Idle In [Idle] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{LTO}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for TGOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{TGO}: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

2.4 Auxiliary Power Unit (APU)

2.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: No

- Auxiliary Power Unit (APU)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

2.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

2.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Clark
Regulatory Area(s): Clark Co, NV; Las Vegas, NV; Las Vegas, NV; Las Vegas, NV

- Activity Title: VGT to R-2502 and back - CCAS: Rockwell OV-10 [LTO in NE Direction]

- Activity Description:
Aircraft/Engine Configuration: Rockwell OV-10 (T76-G-12A engine)
240 LTO Cycles from VGT to R-2502 and back takeoff/land to/from NE direction
Only covers flight operations within Clark County

- Activity Start Date
Start Month: 1
Start Year: 2022

- Activity End Date
Indefinite: No
End Month: 12

End Year: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.037145
SO_x	0.345609
NO_x	3.197692
CO	1.905695
PM 10	0.203489

Pollutant	Total Emissions (TONs)
PM 2.5	0.183141
Pb	0.000000
NH_3	0.000000
CO_2e	1044.6

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Total Emissions (TONs)
VOC	0.037145
SO_x	0.345609
NO_x	3.197692
CO	1.905695
PM 10	0.203489

Pollutant	Total Emissions (TONs)
PM 2.5	0.183141
Pb	0.000000
NH_3	0.000000
CO_2e	1044.6

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: OV-10A
Engine Model: T76-G-12A
Primary Function: General - Turboprop
Aircraft has After burn: No
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	397.00	8.51	1.07	7.40	23.80	0.38	0.34	3234
Approach	476.00	0.92	1.07	8.50	17.20	0.50	0.45	3234
Intermediate	794.00	0.12	1.07	9.90	5.90	0.63	0.57	3234
Military	857.00	0.12	1.07	10.30	2.30	0.71	0.64	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations
Number of Aircraft: 6
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 240
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins):	0
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0
Climb Out [Intermediate] (mins):	10.17
Approach [Approach] (mins):	0
Taxi/Idle In [Idle] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{LTO}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for TGOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year
$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{TGO}: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

3.4 Auxiliary Power Unit (APU)

3.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: No

- Auxiliary Power Unit (APU)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

3.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

3.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

Jean to R-2502 Transit

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Clark Co, NV

b. Action Title: Nellis AFB Contracted Close Air Support (CCAS)

c. Project Number/s (if applicable): N/A

d. Projected Action Start Date: 1 / 2022

e. Action Description:

The Air Force is proposing to provide dedicated CCAS training for 6 CTS JTAC students at Nellis AFB to enhance professional expertise and optimize training opportunities and efficiencies in order to meet combatant commander deployment requirements. CCAS training scenarios would include the use of inert training ordnance used on existing and approved targets following published delivery profiles and safety footprints. The Proposed Action includes elements affecting civil airports proposed for use and military training Special Use Airspace (SUA). The elements affecting the airports proposed for use include CCAS aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the SUA include SUA use and use of inert training ordnance.

f. Point of Contact:

Name: Rahul Chettri
Title: Contractor
Organization: Versar
Email: rchettri@versar.com
Phone Number: (757) 557-0810

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Conformity Analysis Summary:

2022

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	0.003		
NOx	0.224		
CO	0.133		
SOx	0.024		

PM 10	0.014	100	No
PM 2.5	0.013		
Pb	0.000		
NH3	0.000		
CO2e	73.0		

2023 – (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Clark Co, NV			
VOC	0.003		
NOx	0.224		
CO	0.133		
SOx	0.024		
PM 10	0.014	100	No
PM 2.5	0.013		
Pb	0.000		
NH3	0.000		
CO2e	73.0		

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Jean to R-2502 Transit

1. General Information

- Action Location

Base: NELLIS AFB
State: Nevada
County(s): Clark
Regulatory Area(s): Clark Co, NV

- Action Title: Nellis AFB Contracted Close Air Support (CCAS)

- Project Number/s (if applicable): N/A

- Projected Action Start Date: 1 / 2022

- Action Purpose and Need:

Currently, the Air Force cannot self-generate the required amount of aircraft support to meet JTAC Qualification Course (JTACQC) production requirements, reduce current backlogs, or meet staffing requirements in operational units. This proposed action will address this shortfall. The purpose of the CCAS Proposed Action is to provide dedicated CCAS sorties from a civil airport to provide sustained JTACQC for 6th Combat Training Squadron (6 CTS) students. Dedicated CCAS would allow JTACQC support to Nellis AFB and improve and expand training to meet production requirements and support unit readiness.

- Action Description:

The Air Force is proposing to provide dedicated CCAS training for 6 CTS JTAC students at Nellis AFB to enhance professional expertise and optimize training opportunities and efficiencies in order to meet combatant commander deployment requirements. CCAS training scenarios would include the use of inert training ordnance used on existing and approved targets following published delivery profiles and safety footprints. The Proposed Action includes elements affecting civil airports proposed for use and military training Special Use Airspace (SUA). The elements affecting the airports proposed for use include CCAS aircraft, facilities, maintenance, personnel, and sorties. The elements affecting the SUA include SUA use and use of inert training ordnance.

- Point of Contact

Name: Rahul Chettri
Title: Contractor
Organization: Versar
Email: rchettri@versar.com
Phone Number: (757) 557-0810

- Activity List:

Activity Type		Activity Title
2.	Aircraft	Jean to R-2502 - CCAS: Rockwell OV-10 [LTO in SW Direction]
3.	Aircraft	Jean to R-2502 and back - CCAS: Rockwell OV-10 [LTO in NE Direction]

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Aircraft

2.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Clark
Regulatory Area(s): Clark Co, NV

- Activity Title: Jean to R-2502 - CCAS: Rockwell OV-10 [LTO in SW Direction]

- Activity Description:
Aircraft/Engine Configuration: Rockwell OV-10 (T76-G-12A engine)
338 LTO Cycles from Jean to R-2502 and back takeoff/land to/from SW direction
Only covers flight operations within Clark County (i.e., to NV-CA border)

- Activity Start Date
Start Month: 1
Start Year: 2022

- Activity End Date
Indefinite: No
End Month: 12
End Year: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.012088
SO_x	0.112470
NO_x	1.040612
CO	0.620163
PM 10	0.066221

Pollutant	Total Emissions (TONs)
PM 2.5	0.059599
Pb	0.000000
NH_3	0.000000
CO_2e	339.9

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Total Emissions (TONs)
VOC	0.012088
SO_x	0.112470
NO_x	1.040612
CO	0.620163
PM 10	0.066221

Pollutant	Total Emissions (TONs)
PM 2.5	0.059599
Pb	0.000000
NH_3	0.000000
CO_2e	339.9

2.2 Aircraft & Engines

2.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine
Aircraft Designation: OV-10A
Engine Model: T76-G-12A
Primary Function: General - Turboprop
Aircraft has After burn: No
Number of Engines: 2

- Aircraft & Engine Surrogate
Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

2.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	397.00	8.51	1.07	7.40	23.80	0.38	0.34	3234
Approach	476.00	0.92	1.07	8.50	17.20	0.50	0.45	3234
Intermediate	794.00	0.12	1.07	9.90	5.90	0.63	0.57	3234
Military	857.00	0.12	1.07	10.30	2.30	0.71	0.64	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

2.3 Flight Operations

2.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 6
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 338
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins): 0
Takeoff [Military] (mins): 0
Takeoff [After Burn] (mins): 0
Climb Out [Intermediate] (mins): 2.35
Approach [Approach] (mins): 0
Taxi/Idle In [Idle] (mins): 0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins): 0
Approach (mins): 0
Intermediate (mins): 0
Military (mins): 0
AfterBurn (mins): 0

2.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{LTO}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for TGOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year

$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{TGO}: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year

$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year

$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

2.4 Auxiliary Power Unit (APU)

2.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: No

- Auxiliary Power Unit (APU)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

2.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

2.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons

3. Aircraft

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Clark
Regulatory Area(s): Clark Co, NV

- Activity Title: Jean to R-2502 and back - CCAS: Rockwell OV-10 [LTO in NE Direction]

- Activity Description:
Aircraft/Engine Configuration: Rockwell OV-10 (T76-G-12A engine)
338 LTO Cycles from Jean to R-2502 and back takeoff/land to/from NE direction
Only covers flight operations within Clark County

- Activity Start Date
Start Month: 1
Start Year: 2022

- Activity End Date
Indefinite: No
End Month: 12

End Year: 2031

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.013888
SO_x	0.129221
NO_x	1.195597
CO	0.712528
PM 10	0.076083

Pollutant	Total Emissions (TONs)
PM 2.5	0.068475
Pb	0.000000
NH_3	0.000000
CO_2e	390.6

- Activity Emissions [Flight Operations (includes Trim Test & APU) part]:

Pollutant	Total Emissions (TONs)
VOC	0.013888
SO_x	0.129221
NO_x	1.195597
CO	0.712528
PM 10	0.076083

Pollutant	Total Emissions (TONs)
PM 2.5	0.068475
Pb	0.000000
NH_3	0.000000
CO_2e	390.6

3.2 Aircraft & Engines

3.2.1 Aircraft & Engines Assumptions

- Aircraft & Engine

Aircraft Designation: OV-10A
Engine Model: T76-G-12A
Primary Function: General - Turboprop
Aircraft has After burn: No
Number of Engines: 2

- Aircraft & Engine Surrogate

Is Aircraft & Engine a Surrogate? No
Original Aircraft Name:
Original Engine Name:

3.2.2 Aircraft & Engines Emission Factor(s)

- Aircraft & Engine Emissions Factors (lb/1000lb fuel)

	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e
Idle	397.00	8.51	1.07	7.40	23.80	0.38	0.34	3234
Approach	476.00	0.92	1.07	8.50	17.20	0.50	0.45	3234
Intermediate	794.00	0.12	1.07	9.90	5.90	0.63	0.57	3234
Military	857.00	0.12	1.07	10.30	2.30	0.71	0.64	3234
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3234

3.3 Flight Operations

3.3.1 Flight Operations Assumptions

- Flight Operations

Number of Aircraft: 6
Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft: 338
Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft: 0
Number of Annual Trim Test(s) per Aircraft: 0

- Default Settings Used: No

- Flight Operations TIMs (Time In Mode)

Taxi/Idle Out [Idle] (mins):	0
Takeoff [Military] (mins):	0
Takeoff [After Burn] (mins):	0
Climb Out [Intermediate] (mins):	2.7
Approach [Approach] (mins):	0
Taxi/Idle In [Idle] (mins):	0

Per the Air Emissions Guide for Air Force Mobile Sources, the defaults values for military aircraft equipped with after burner for takeoff is 50% military power and 50% afterburner. (Exception made for F-35 where KARNES 3.2 flight profile was used)

- Trim Test

Idle (mins):	0
Approach (mins):	0
Intermediate (mins):	0
Military (mins):	0
AfterBurn (mins):	0

3.3.2 Flight Operations Formula(s)

- Aircraft Emissions per Mode for LTOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
LTO: Number of Landing and Take-off Cycles (for all aircraft)
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for LTOs per Year

$AE_{LTO} = AEM_{IDLE\_IN} + AEM_{IDLE\_OUT} + AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{LTO}: Aircraft Emissions (TONs)
AEM_{IDLE_IN}: Aircraft Emissions for Idle-In Mode (TONs)
AEM_{IDLE_OUT}: Aircraft Emissions for Idle-Out Mode (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for TGOs per Year

$AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * TGO / 2000$

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (TONs)
TIM: Time in Mode (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
TGO: Number of Touch-and-Go Cycles (for all aircraft)

2000: Conversion Factor pounds to TONs

- Aircraft Emissions for TGOs per Year
$AE_{TGO} = AEM_{APPROACH} + AEM_{CLIMBOUT} + AEM_{TAKEOFF}$

AE_{TGO}: Aircraft Emissions (TONs)
$AEM_{APPROACH}$: Aircraft Emissions for Approach Mode (TONs)
$AEM_{CLIMBOUT}$: Aircraft Emissions for Climb-Out Mode (TONs)
$AEM_{TAKEOFF}$: Aircraft Emissions for Take-Off Mode (TONs)

- Aircraft Emissions per Mode for Trim per Year
$AEPS_{POL} = (TD / 60) * (FC / 1000) * EF * NE * NA * NTT / 2000$

$AEPS_{POL}$: Aircraft Emissions per Pollutant & Power Setting (TONs)
TD: Test Duration (min)
60: Conversion Factor minutes to hours
FC: Fuel Flow Rate (lb/hr)
1000: Conversion Factor pounds to 1000pounds
EF: Emission Factor (lb/1000lb fuel)
NE: Number of Engines
NA: Number of Aircraft
NTT: Number of Trim Test
2000: Conversion Factor pounds to TONs

- Aircraft Emissions for Trim per Year
$AE_{TRIM} = AEPS_{IDLE} + AEPS_{APPROACH} + AEPS_{INTERMEDIATE} + AEPS_{MILITARY} + AEPS_{AFTERBURN}$

AE_{TRIM}: Aircraft Emissions (TONs)
$AEPS_{IDLE}$: Aircraft Emissions for Idle Power Setting (TONs)
$AEPS_{APPROACH}$: Aircraft Emissions for Approach Power Setting (TONs)
$AEPS_{INTERMEDIATE}$: Aircraft Emissions for Intermediate Power Setting (TONs)
$AEPS_{MILITARY}$: Aircraft Emissions for Military Power Setting (TONs)
$AEPS_{AFTERBURN}$: Aircraft Emissions for After Burner Power Setting (TONs)

3.4 Auxiliary Power Unit (APU)

3.4.1 Auxiliary Power Unit (APU) Assumptions

- Default Settings Used: No

- Auxiliary Power Unit (APU)

Number of APU per Aircraft	Operation Hours for Each LTO	Exempt Source?	Designation	Manufacturer

3.4.2 Auxiliary Power Unit (APU) Emission Factor(s)

- Auxiliary Power Unit (APU) Emission Factor (lb/hr)

Designation	Fuel Flow	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CO_2e

3.4.3 Auxiliary Power Unit (APU) Formula(s)

- Auxiliary Power Unit (APU) Emissions per Year
$APU_{POL} = APU * OH * LTO * EF_{POL} / 2000$

APU_{POL}: Auxiliary Power Unit (APU) Emissions per Pollutant (TONs)
APU: Number of Auxiliary Power Units
OH: Operation Hours for Each LTO (hour)
LTO: Number of LTOs
EF_{POL}: Emission Factor for Pollutant (lb/hr)
2000: Conversion Factor pounds to tons