Final Report for 2019 Southern Ute Indian Tribe Emissions Inventory for Criteria Pollutants, Hazardous Air Pollutants, and Greenhouse Gases

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Emission Inventory Report

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List of Acronyms

AP-42	EPA Compilation of Air Pollutant Emission Factors
AQP	Air Quality Program
CAA	Clean Air Act
CO	Carbon Monoxide
CO2*e*	Carbon Dioxide Equivalent
CY	Calendar Year
CFR	Code of Federal Regulations
EI	Emissions Inventory
EIS	Emission Inventory System
EPA	United States Environmental Protection Agency
FLIGHT	Facility Level Information on GreenHouse gases Tool
GHG	Greenhouse gas
IC	Internal Combustion
HAP	Hazardous Air Pollutants
Kdf	Cretaceous Fruitland Formation
Kpcl	Cretaceous Picture Cliffs Sandstone
NEI	National Emissions Inventory
NO_x	Oxides of Nitrogen
PM10	Particulate Matter 10 microns and smaller
PM10-PRI	Particulate Matter 10 microns and smaller – Primary Emissions
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
QA	Quality Assurance
Reservation	Southern Ute Indian Reservation
SO_2	Sulfur Dioxide
TEG	Tri-Ethylene Glycol
TEISS	Tribal Emissions Inventory Software Solutions
Title V	Title V Operating Permit Program
TMNSR	Tribal Minor New Source Review Program
Tribe	Southern Ute Indian Tribe

TPY	Tons per Year
VOC	Volatile Organic Compounds

I. EXECUTIVE SUMMARY

The Southern Ute Indian Tribe (Tribe) Air Quality Program (AQP) has prepared an emissions inventory (EI) of all Title V Operating Permit Program (Title V) and Synthetic Minor quantifiable point sources on the Southern Ute Indian Reservation (Reservation) for calendar year (CY) 2019. The EI was prepared with data from federal annual emission reports, tribal annual emission fee forms, and emission calculations completed by the AQP.

Oil and natural gas production is the predominant industry on the Reservation and emissions data for these sources were collected directly from source operators through annual emission inventories and other pertinent reports.

As of January 2019, there were a total of 35 sources operating under Title V operating permits and six sources operating as Synthetic Minor Sources under Tribal Minor New Source Review (TMNSR) permits. Figure 1 shows a map of the Southern Ute Indian Reservation with the Title V and permitted TMNSR Sources.

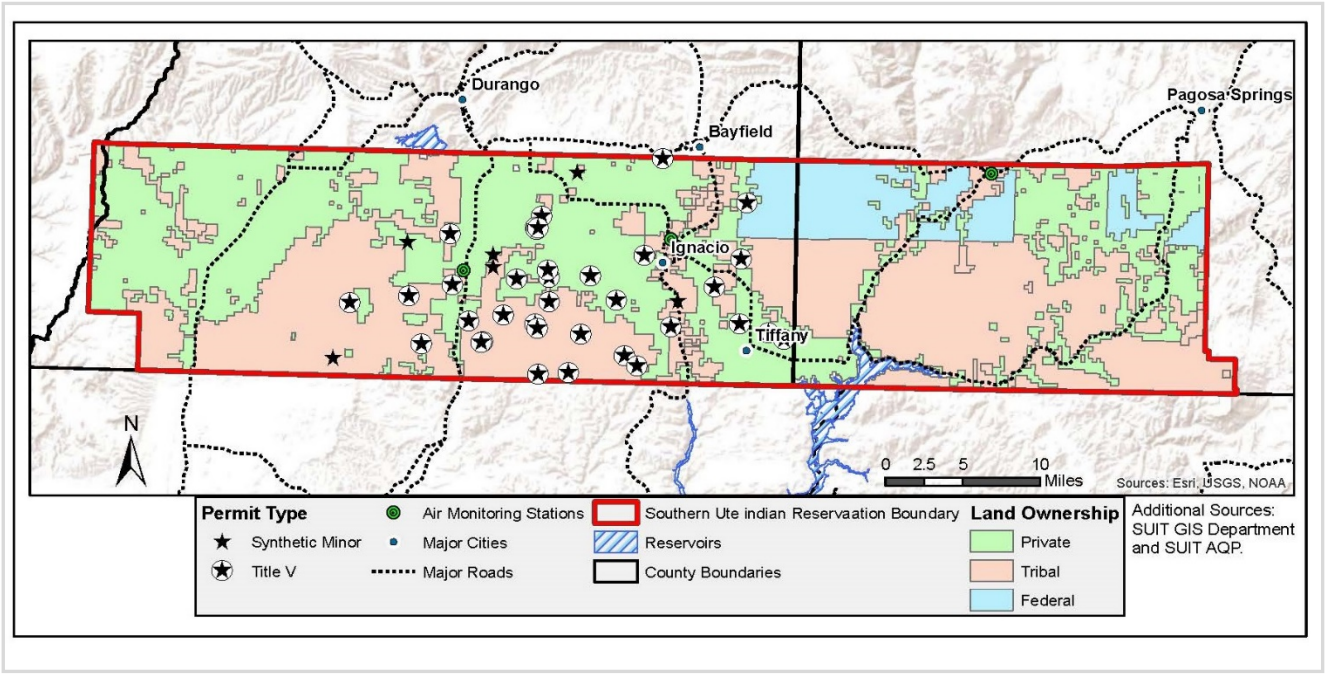

Figure 1: Title V and permitted TMNSR sources located within the exterior boundaries of the Southern Ute Indian Reservation

Reservation emission totals for CY2019 were 2,520.0 tons of Oxides of Nitrogen (NO_x), 1,143.1 tons of Volatile Organic Compounds (VOC), 51.2 tons of Sulfur Dioxide (SO_2), 106.2 tons of Particulate Matter shown as PM10-PRI (primary particulate matter with diameter less than or equal to 10 micrometers emitted directly into air by a source, includes both filterable and condensable components), 1,925.3 tons of Carbon Monoxide (CO), 337.9 tons of total Hazardous Air Pollutants (HAP), and 1,946,432 tons of Greenhouse Gas (GHG) emissions measured in Carbon Dioxide Equivalents (CO_2e). Total criteria pollutant and HAP emissions on the Reservation for 2019 are presented below in Figure 2.

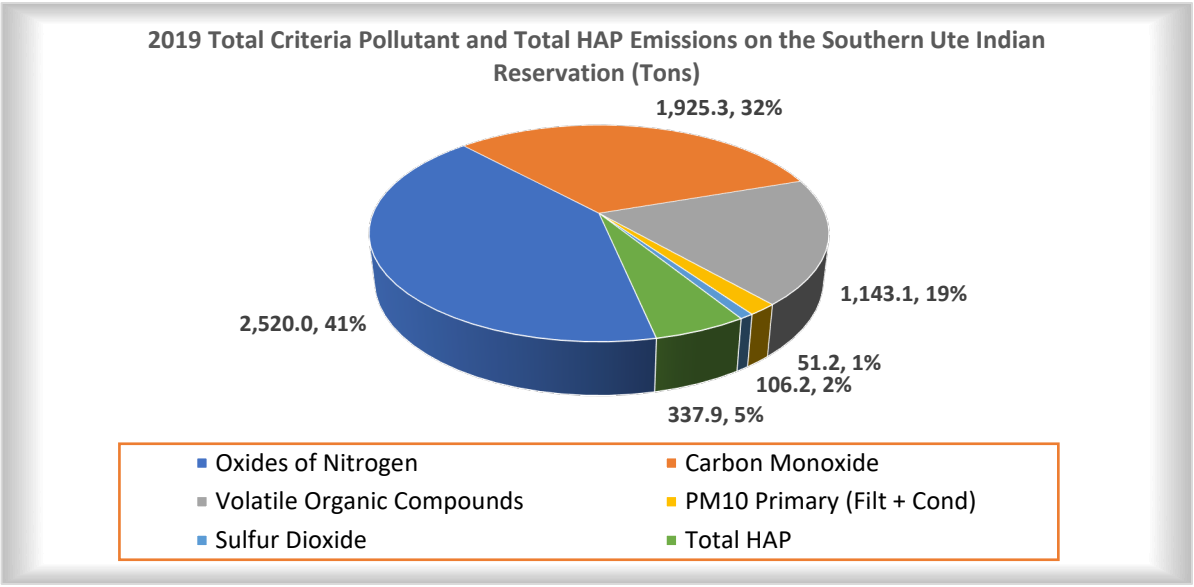

Figure 2: 2019 Total Criteria Pollutant and Total HAP Emissions on the Southern Ute Indian Reservation [Tons]

II. OVERVIEW

II.1 Purpose of Inventory

The purpose of this EI was to compile emissions from Title V and TMNSR permitted sources for the 2019 calendar year. As required by the Clean Air Act (CAA) 103 work plan components 3.2 and 3.4, the AQP compiles and submits yearly EIs to EPA's National Emission Inventory (NEI). The emissions data for the Reservation presented in this EI has been organized by pollutant and equipment type. The EI may be used for future air quality planning purposes, such as development of air quality regulations targeted at ozone precursors for maintaining attainment with the National Ambient Air Quality Standards, emissions modeling, and Title V permitting fee analysis.

The primary air pollutants included in this EI are NO_x, CO, PM_{10}, SO_2, VOC, HAP and GHG.

II.2 Geographic Location of southern Ute Indian Reservation

The Reservation is located in southwestern Colorado. The Reservation land area covers 1,064 square miles in three counties (La Plata, Archuleta, and Montezuma) and borders New Mexico to the south.[1] The total area covered by this inventory is approximately 681,000 acres, which encompasses all land within the external boundaries of the Reservation. The Tribe and/or its members own approximately 320,000 acres, while the remaining land mass is comprised of non-Indian (private) and government land in a checkerboard fashion. The primary land use is agricultural, and the predominant industry is oil and natural gas production.

II.3 Climate

The Reservation remains generally semi-arid throughout the year. Located north of northern New Mexico desert land and south of the Colorado alpines, the average temperature range during the winter months is between 20 and 40 degrees Fahrenheit. Freezing temperatures are common throughout the winter and during the 2019 calendar year the coldest month was December with a monthly average of 19.4 degrees Fahrenheit and had the lowest temperature with -7.2 degrees Fahrenheit. During the summer months, the peak temperatures typically remain in the high eighties to low nineties. The warmest month of 2019 was July with a monthly average of 68.9 degrees Fahrenheit. July had the highest temperature with 92.5 degrees Fahrenheit. Snow is the dominant form of precipitation on the Reservation. The total

[1] Southern Ute Indian Tribe (2019). *History of the Southern Ute*. Retrieved from: https://www.southernute-nsn.gov/history/

precipitation for calendar year 2019 was 21.7 inches. The driest month was October with 0.2 inches of precipitation and the wettest month was February with 4.2 inches of precipitation.[2] *[Winter months have been defined as the months from November through February. Summer months have been defined as the months from June through September.]*

II.4 Geology

The Reservation is situated in the northern portion of the San Juan Basin, a geologic structural basin underlying southwestern Colorado and northwestern New Mexico. The basin is composed of Cambrian to Holocene aged sedimentary rocks and contains one of the largest coal-bed methane natural gas fields in the world within the Cretaceous aged Fruitland Formation.[3] The majority of the natural gas production on the Reservation is coalbed methane from the Fruitland Formation, but conventional natural gas is also produced from Cretaceous aged sandstone reservoirs of the Pictured Cliffs Formation, Mesa Verde Group, and the Dakota Sandstone. Tight gas reservoirs of the Cretaceous aged Mancos Shale have also been drilled; however, no significant exploration and production has occurred within the Reservation as of 2019.

II.5 Sources

The only sources included in this emissions inventory are larger point sources, either permitted under the Tribe's Title V Program or permitted through EPA's TMNSR Program.

[2] Southern Ute Indian Tribe: Ambient Monitoring. (2018). *2018 AQS Ute 3 Humidity and Temperature Hourly Data.* Retrieved from: http://www.southernute-nsn.gov/environmental-programs/air-quality/ambient-monitoring/

[3] Fasset, J. E., & Hinds, J. S. (1971). Geology and Fuel Resources of the Fruitland Formation and Kirtland Shale of the San Juan Basin, New Mexico and Colorado. Geological Survey Professional Paper 676. United States Government Printing Office. Retrieved from https://pubs.usgs.gov/pp/0676/report.pdf

III. DATA QUALITY OBJECTIVES

Data objectives for this inventory are as follows:

III.1 Accuracy

- Data for this EI were collected using measured data from reputable sources such as EPA, direct emission measurements and calculated emissions from permitted sources. The AQP staff also uses professional judgement to review the emissions from permitted facilities and flags any conspicuously inconsistent data.
- Title V facilities are required to submit an Annual Fee Calculation Worksheet to AQP. Emissions are calculated by the operator using calculation models and emission factors of their choice. Permitted TMNSR (Synthetic Minor) facilities submit an annual emission report to EPA. AQP obtains the emissions for permitted TMNSR facilities from EPA.
- Utilize emission calculation models when available (GRI-GLYCalc 4.0; Tanks 4.09d; AP-42, Fifth Edition; Caterpillar Engine Rating Pro 4.01.02; Waukesha Bulletin 7005 0710; Solar Turbines February 12, 2013 Predicted Emission Performance Emission Factors; etc.)
- Actual running times were used when available. If actual running times were not available, maximum running times (8,760 hours) were used.
- Quality Assurance tests are run through the Tribal Emission Inventory Software Solution (TEISS), version 3.6.26 and EPA's Emissions Inventory System (EIS).
    - Quality assurance tests check for data completeness, accuracy, format, and pollutant emission ranges.
- Staff spot review of larger reported emission calculations for accuracy and use of professional judgement in review of smaller reported emissions.

III.2 Uncertainty

- Some of the reported emissions by the operators may be inaccurate.
- Some emissions may be reported as Potential to Emit (PTE) and may not represent actual emissions.
- If actual facility criteria and HAP emissions or PTE were not reported, previous calendar year emissions may be used.
- Not all facilities are required to submit GHG emissions. If GHG emission were not reported for CY2019, then the GHG emissions were either used from CY2018 or calculated by the AQP using an emissions calculator tool or obtained from EPA's Facility Level Information on GreenHouse gases Tool (FLIGHT) map.

III.3 Completeness

- Capture 100% of Title V point source emissions reported in the annual emission fees for CY2019.
- TMNSR permitted facilities are required to report emissions for the pollutants specifically regulated with enforceable emission limits in each respective permit. The missing criteria and HAP emissions estimates as well as GHG data for permitted TMNSR sources were calculated using emissions calculator tool developed by AQP which takes into account factors such as equipment type, equipment site rating, hours of operation, fuel consumption rate, emissions factor from EPA's AP-42 resource, along with data from the CY2018 Comprehensive Emissions Inventory report.
- TMNSR permitted facilities are only required to report emissions for emission units specifically regulated with enforceable emission limits or controls in each respective permit. Emission units not listed in the TMNSR permit may be unaccounted for.

III.4 Comparability

- EI results will be compared with results from previous emission inventories.
- Emission factors and assumptions will be compared with methodologies used in similar emission calculation applications.

IV. POINT SOURCES

IV.1 Title V Permitted Sources

Description of Sources

Thirty-five Title V sources operated on the Reservation during CY2019. Sources include natural gas compressor stations, central delivery points, treating plants, processing plants, a saltwater disposal facility, and a municipal solid waste disposal site.

Title V sources are defined as sources with the PTE 100 tons of a single criteria pollutant, 25 tons of HAP in aggregate, or ten tons of an individual HAP. The Tribe has full delegation of a Title V Operating Permit Program under 40 CFR Part 70 and during calendar year 2019, all 35 oil and gas sources operated under Tribally-issued Part 70 Title V permits.

Data Collection

Title V sources are required to report emissions annually and pay a per-ton emission fee for pollutants emitted. Emissions data for Title V sources were collected directly from the CY2019 fee calculation worksheets submitted by each source to the Tribe. Actual emissions data were available for all 35 Title V oil and gas sources. Some facilities did not report GHG emissions. The missing GHG emissions data for these sources were obtained from the EPA's FLIGHT map.

Equipment

A brief description of equipment from which emissions are included in this report is provided in the following:

- Internal Combustion (IC) Engines: The IC Engines are used in the oil and gas industry to compress natural gas, pump liquids, generate electricity and to provide artificial lift. In an IC Engine, the combustion and ignition of the fuel occurs within the engine itself. IC Engines can be two-stroke or four-stroke, the difference between them being how quickly the combustion cycle process (intake, compression, combustions, exhaust) takes, based on the number of times of piston movement in the engine.
- Turbines: Natural gas-fired turbines are used by the oil and gas industry for natural gas transmission and electricity generation. They operate by introducing compressed air and fuel into a combustion chamber to generate hot gases which are expanded into the power turbine to rotate the power shaft and create work. Two types of combustion processes are used in turbines, the first being lean-premix staged combustion in which a lean air and fuel mixture is introduced into the combustion chamber, and the second type being diffusion flame combustion where the air and fuel mixing occurs within the combustion chamber.

- Distillation Column/Stripper: Tri-ethylene glycol (TEG) dehydration units are commonly used in the oil and gas industry to remove entrained water from the natural gas stream to meet pipeline contract water specifications. The dehydration process begins with routing the natural gas stream through TEG in an absorber where entrained water is absorbed by the TEG. During this step, hydrocarbons present in the natural stream are also absorbed in the glycol. Following the absorption step, the water saturated glycol is then distilled to drive off absorbed water before being re-circulate to the absorber.
- Tanks: The oil and gas industry utilize liquid storage tanks for the storage of produced water, condensate, oil, coolants, and lubricants. Emissions from storage tanks include breathing and working losses, flash emissions, and tank loadout.
- Heaters: These are natural gas fired external combustion sources used widely in the oil and gas industry. Thermal fluid heaters are used for various process heating applications such as heating emulsions, natural gases, regeneration gases, chemical, heat transfer and specialty fluids.
- Boilers: Boilers in the oil and gas industry are commonly used to generate large amounts of steam. The steam can be used for variety of different purposes which include steam stripping, steam distillation, process heating and vacuum distillation.
- Others: This category includes collection of miscellaneous equipment/emission sources for which emissions were included in this report. These include but are not limited to flares, cooling towers, engine test cells, open air fugitive sources, open storage piles and unclassified sources.

Emissions

Total criteria pollutant, total HAP and GHG emissions from Title V sources for CY2019 are displayed below in Table 1 and Figure 3.

Table 1: 2019 Title V Source Criteria Pollutant, Total HAP and GHG Emissions for the Southern Ute Indian Reservation [Tons]

Pollutant	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic Compounds	PM10 Primary (Filt + Cond)	Sulfur Dioxide	Total HAP	Greenhouse Gases (CO_2e)
Emissions	2,155.0	1,692.2	982.9	99.7	45.3	294.7	1,797,643.5

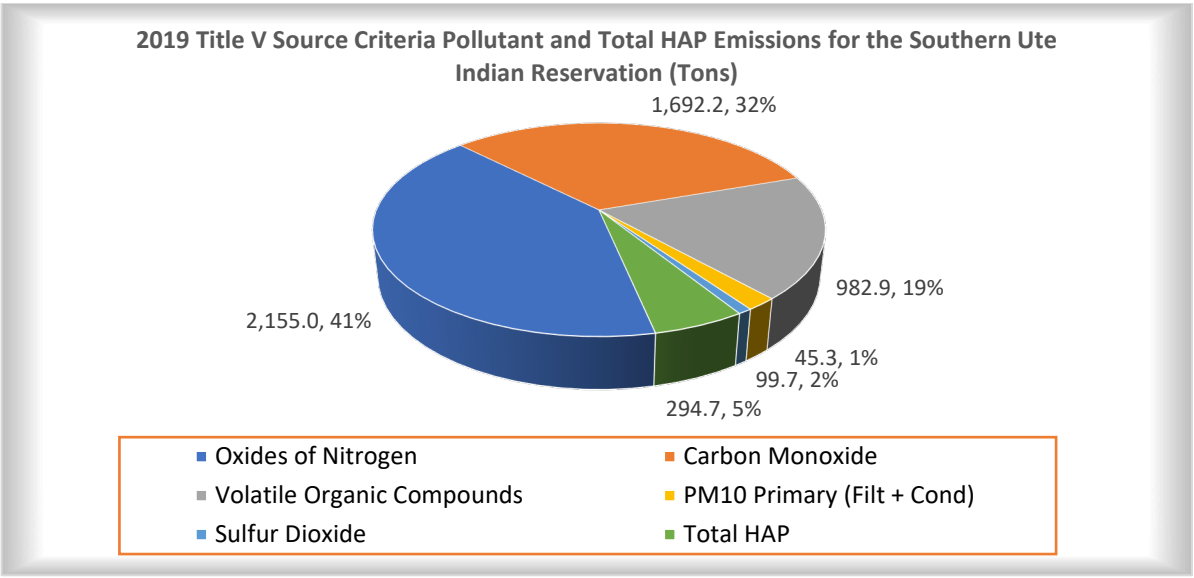

Figure 3: 2019 Title V Source Criteria Pollutant and Total HAP on the Southern Ute Indian Reservation [Tons]

NOx emissions by equipment type at Title V sources for the 2019 calendar year are displayed below in Figure 4.

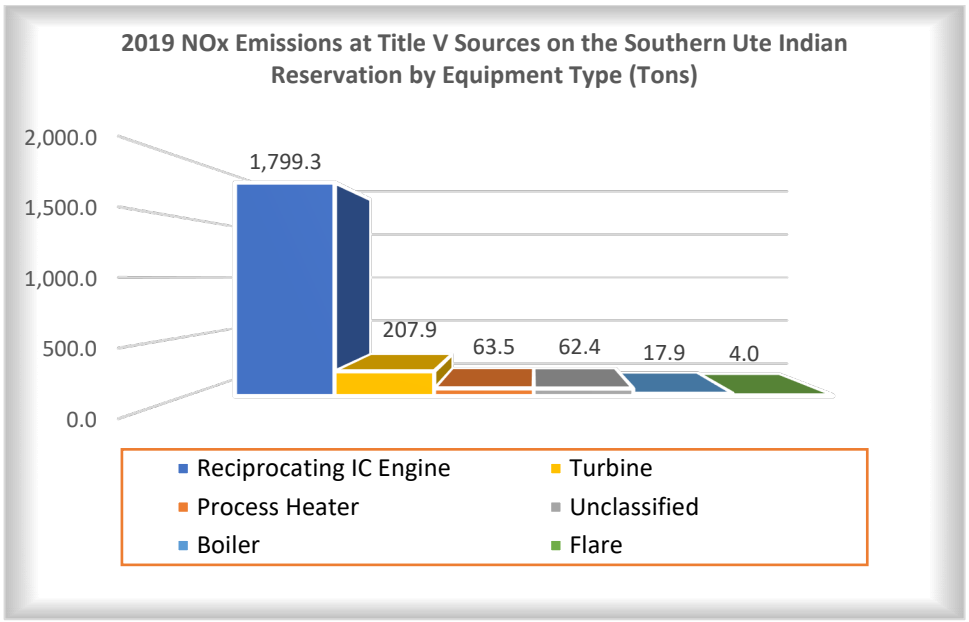

Figure 4: 2019 NOx Emissions at Title V Sources on the Southern Ute Indian Reservation by Equipment Type [Tons]

VOC emissions by equipment type at Title V sources for the 2019 calendar year are displayed below in Figure 5.

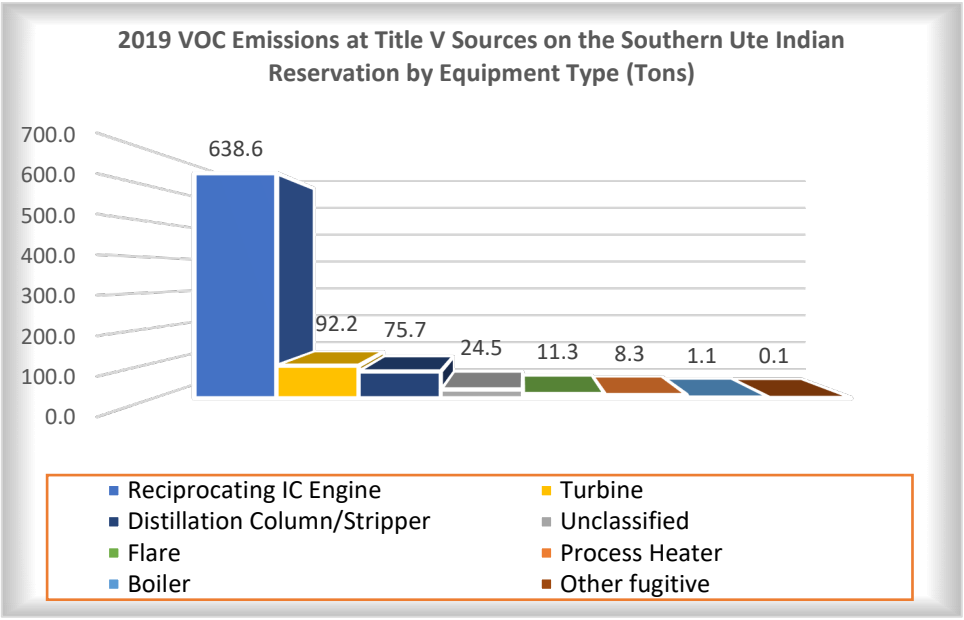

Figure 5: 2019 VOC Emissions at Title V Sources on the Southern Ute Indian Reservation by Equipment Type [Tons]

CO emissions by equipment type at Title V sources for the 2019 calendar year are displayed below in Figure 6.

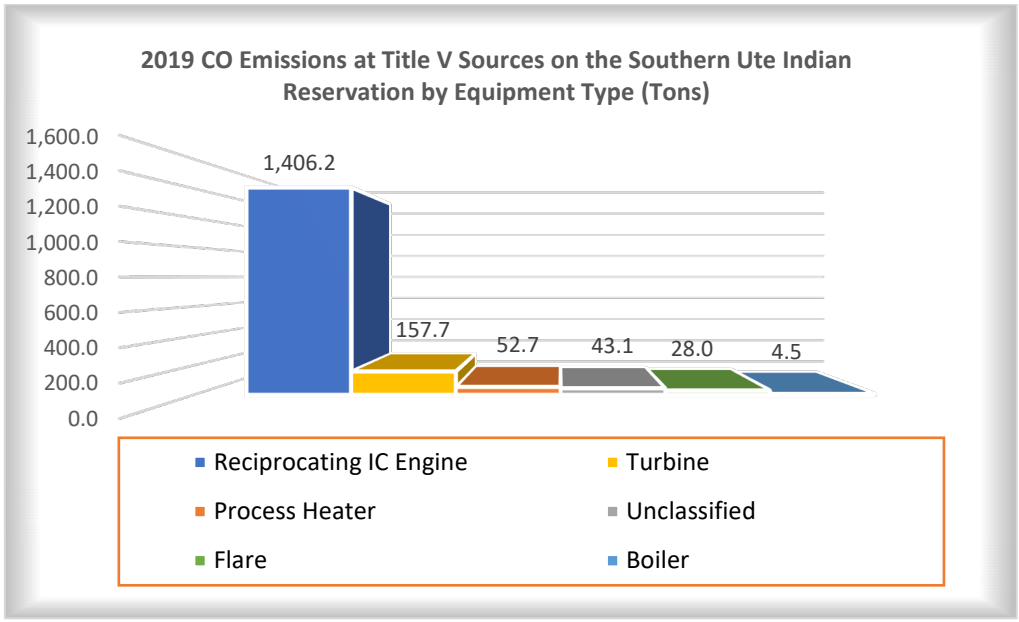

Figure 6: CO Emissions at Title V Sources on the Southern Ute Indian Reservation by Equipment Type [Tons]

Total and speciated 2019 HAP emissions from Title V sources are displayed below in Table 2 and Figure 7.

Table 2: 2019 Title V Sources HAP Emissions on the Southern Ute Indian Reservation [Tons]

Pollutant	**Emissions [Tons]**
Formaldehyde	197.9
Toluene	27.2
Acetaldehyde	21.6
Xylenes	16.5
Acrolein	13.1
Benzene	9.5
Methanol	6.1
Ethylbenzene	2.1
n-Hexane	0.6
Other HAP	0.1
Total	**294.7**

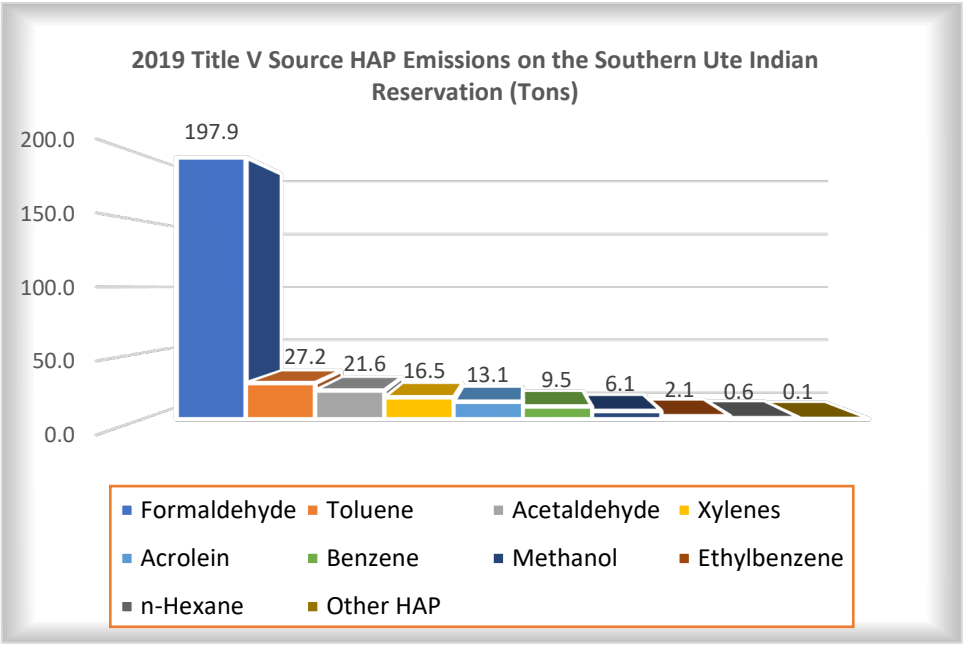

Figure 7: 2019 Title V Source HAP Emissions on the Southern Ute Indian Reservation [Tons]

HAP emissions by equipment type at Title V sources for CY2019 are displayed below in Figure 8.

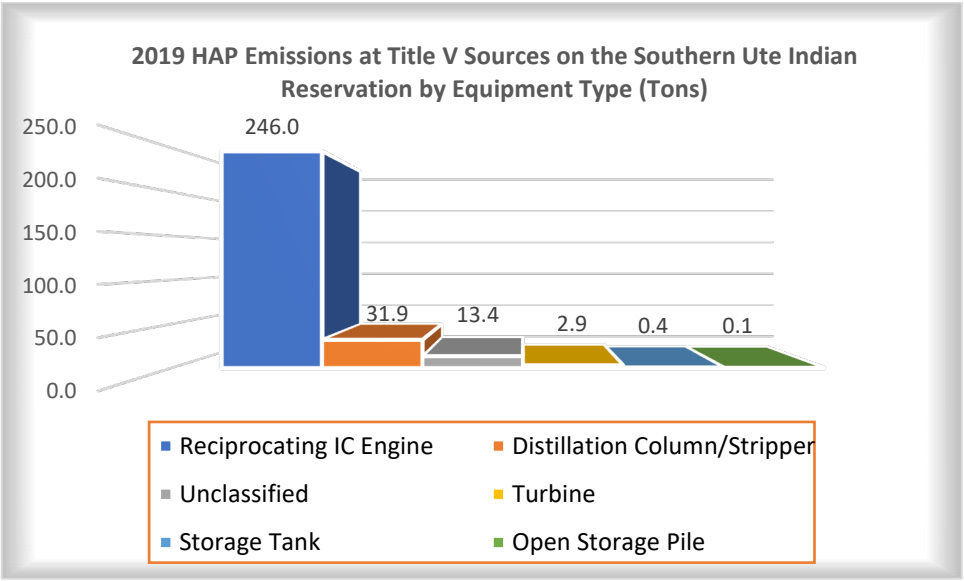

Figure 8: 2019 HAP Emissions at Title V Sources on the Southern Ute Indian Reservation by Equipment Type [Tons]

Title V equipment counts for the CY2019 EI are displayed below in Figure 9.

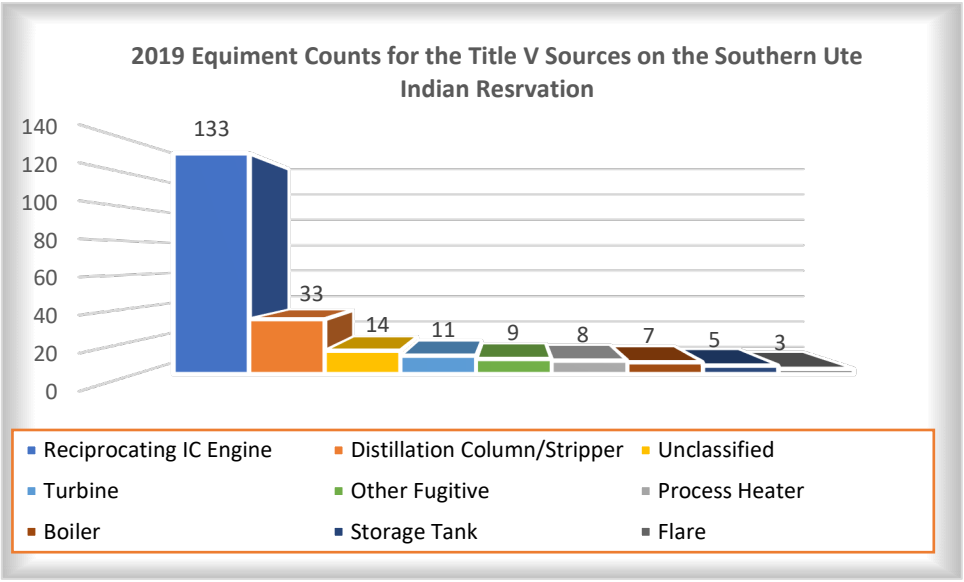

Figure 9: 2019 Equipment Counts for Title V Sources on the Southern Ute Indian Reservation

Summary

NO_x emissions represent the largest portion of criteria pollutant emissions from Title V sources on the Reservation, with 41% of the total criteria pollutant emissions. CO emissions represent the second largest pollutant emission with 32% of the total criteria pollutant emissions. Title V sources reported emissions from more than 200 pieces of equipment, with

IC engines representing the majority of the equipment type at 60% of the total equipment count. Proportionally high IC engine counts correlate with NO_x and CO emissions representing the majority of criteria pollutant emissions.

Formaldehyde emissions represent the largest portion of HAP emission from Title V sources on the Reservation with 67% of the total HAP emissions on the Reservation. As previously stated, IC engines are the primary equipment type at Title V sources and are responsible for majority of formaldehyde emissions.

IV.2 Permitted Tribal Minor New Source Review Point Sources

The TMNSR permitting program is found at 40 CFR Part §49.151 through §49.164.[4] The TMNSR permitting program includes new or modified source permitting, permits by rule, and a registration program for true minor sources that commenced construction prior to the date of the rule promulgation. For the purposes of this inventory, only "Synthetic Minor" TMNSR permitted oil and natural gas sources have been included.

The Synthetic Minor TMSNR permitted category reflects larger emission sources that would be subject to either the Prevention of Significant Deterioration (PSD), Title V Program, or both programs absent enforceable emission limitations to reduce the source's PTE. To avoid the double counting of emissions for sources that have both a Title V and Synthetic Minor Permits, this section of the inventory only includes emissions from sources that obtained Synthetic Minor Source permits to reduce emission levels below the Title V Program emission thresholds.

During calendar year 2019 six sources operated under Synthetic Minor permits to reduce emissions below Title V permitting thresholds and did not operate under a Title V permit.

Data Collection

Only the six sources with Synthetic Minor TMNSR permitted emissions below the Title V permitting thresholds were included in this category in order to avoid double counting emissions. Emissions from the remaining five sources, which hold Title V operating permits issued by the Tribe, were already accounted for under the Title V Oil and Gas Sources category of this inventory.

Synthetic Minor TMNSR permitted sources are required to submit annual emissions inventories to EPA Region 8 for the pollutants regulated under each permit. Emission data was collected directly from these annual emissions inventories submitted to EPA for calendar year 2019.[5] Two TMNSR permitted facilities reported only CO and formaldehyde emissions.

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[4] 40 CFR Part 49 - Indian Country: Air Quality Planning and Management. (2018). U.S. Government Publishing Office. Retrieved from http://www.ecfr.gov/cgi-bin/text-idx?SID=bc4187dbf0b08beb092efe4251fe4493&mc=true&tpl=/ecfrbrowse/Title40/40cfr49_main_02.tpl

[5] CY 2018 EPA TMNSR Annual Emissions Forms.

One TMNSR permitted facility reported CO and NOx emissions for one engine, and CO and formaldehyde for the other. Three permitted TMNSR facilities provided emissions for criteria pollutants and HAP. Green House Gas (GHG) emissions were not reported by any Synthetic Minor TMNSR permitted facilities. The missing criteria and HAP emissions estimates as well as GHG data for permitted TMNSR sources were calculated using emissions calculator tool developed by AQP which takes into account factors such as equipment type, equipment site rating, hours of operation, fuel consumption rate, emissions factor from EPA's AP-42 resource, along with data from the CY2018 Comprehensive Emissions Inventory report

Equipment

The equipment used by the permitted TMNSR sources, from which emissions are included in this report, are the same equipment type described in Section IV.1 Title V Permitted Sources of this report.

Emissions

Total 2019 criteria pollutant, HAP, and GHG emissions from permitted TMNSR sources on the Southern Ute Indian Reservation are presented below in Table 3.

Table 3: 2019 Criteria Pollutant, HAP, and GHG Emissions for permitted TMNSR Sources on the Southern Ute Indian Reservation [Tons]

Pollutant	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic Compounds	PM10 Primary (Filt + Cond)	Total HAP	Greenhouse Gases (CO_2e)
Emissions	365.0	233.1	160.2	6.5	43.2	148,788.8

Total criteria pollutant and HAP emissions from permitted TMSNR sources on the Southern Ute Indian Reservation are presented below in Figure 10.

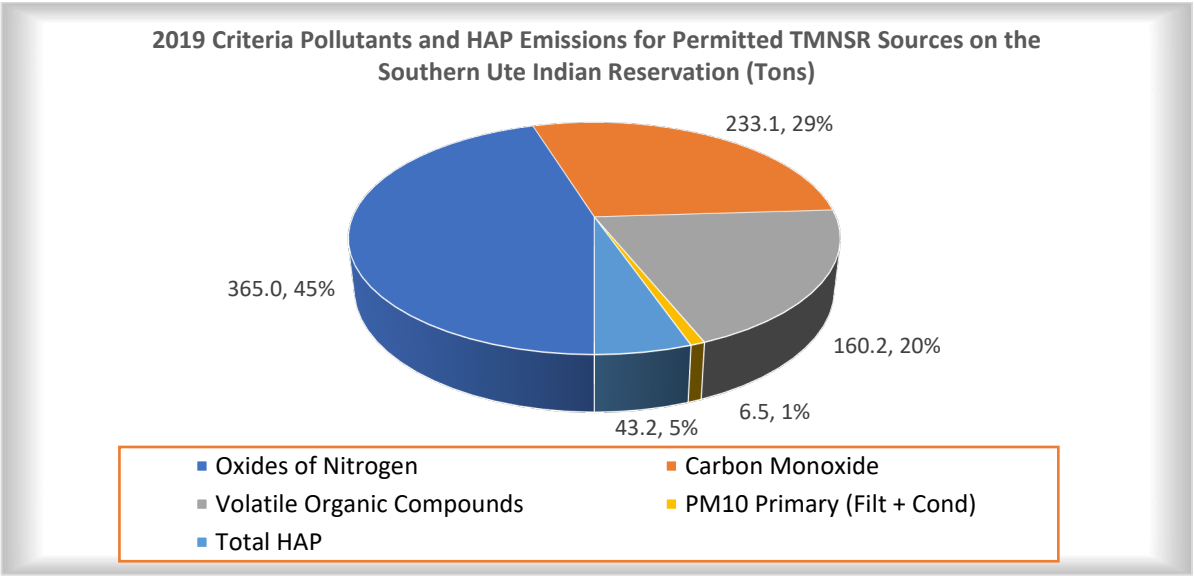

Figure 10: 2019 Criteria Pollutant and HAP Emissions for Permitted TMNSR Sources on the Southern Ute Indian Reservation [Tons]

Total 2019 NO_x emissions by equipment type from permitted TMNSR sources on the Reservation are displayed below in Figure 11.

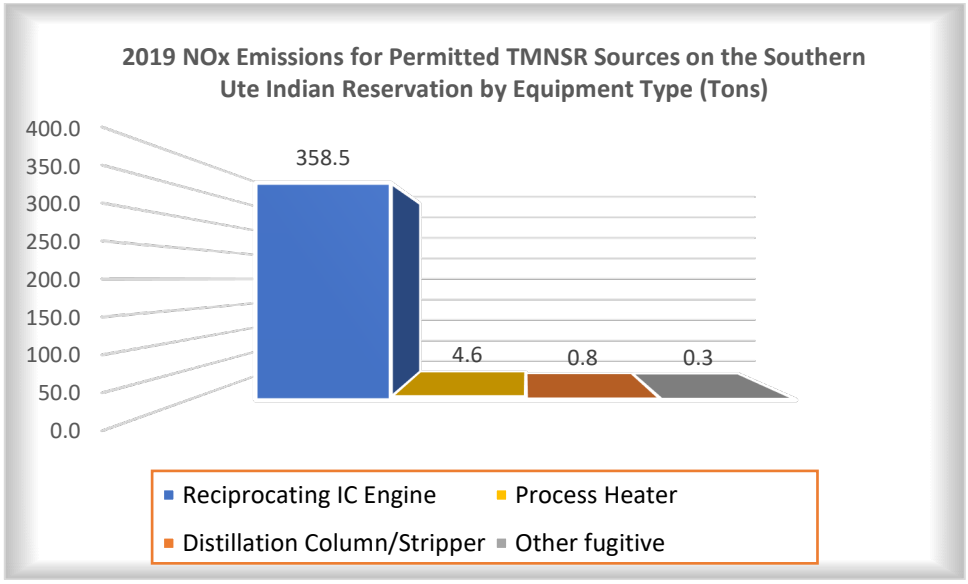

Figure 11: 2019 NO_x Emissions for Permitted TMNSR Sources on the Southern Ute Indian Reservation by Equipment Type [Tons]

Total 2019 VOC emissions by equipment type from permitted TMNSR sources on the Reservation are displayed below in Figure 12.

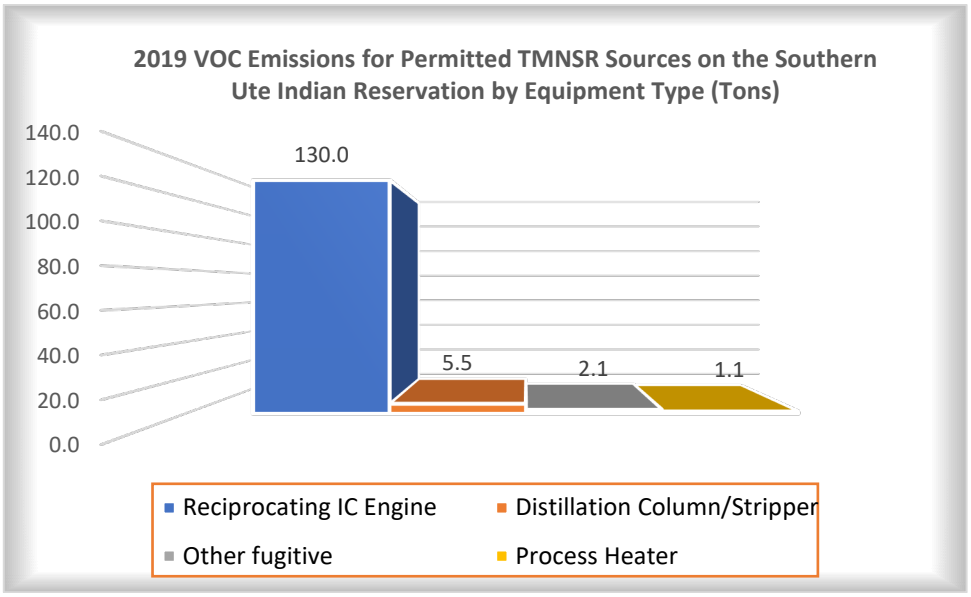

Figure 12: 2019 VOC Emissions for Permitted TMNSR Sources on the Southern Ute Indian Reservation by Equipment Type [Tons]

Total 2019 CO emissions by equipment type from permitted TMNSR sources on the Reservation are displayed below in Figure 13.

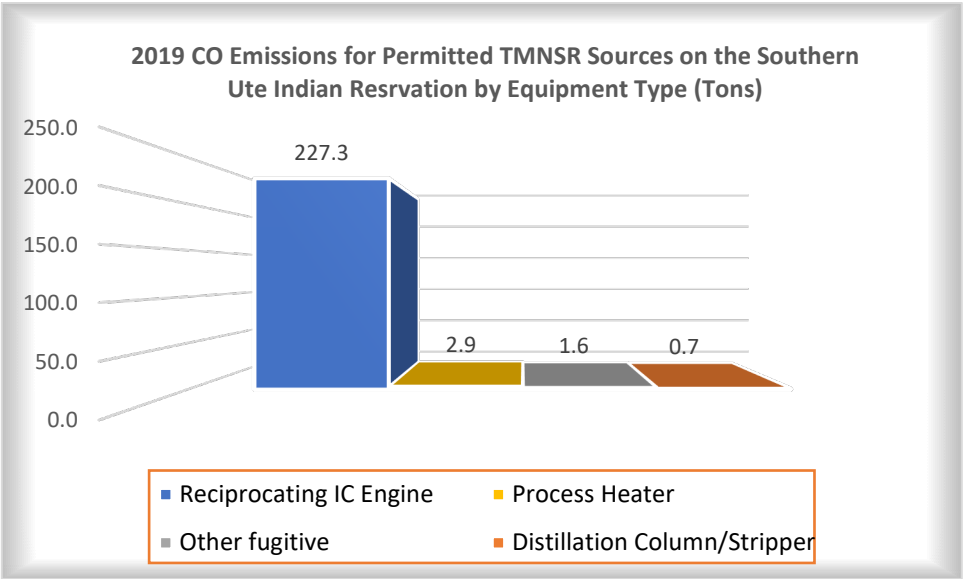

Figure 13: 2019 CO Emissions for Permitted TMNSR Sources on the Southern Ute Indian Reservation by Equipment Type [Tons]

Total 2019 speciated HAP emissions from permitted TMNSR sources on the Reservation are displayed below in Table 4 and Figure 14.

Table 4: Speciated HAP Emissions for Permitted TMNSR Sources on the Southern Ute Indian Reservation [Tons]

Pollutant	Emissions [Tons]
Formaldehyde	27.1
Acetaldehyde	4.2
Acrolein	2.5
Methanol	1.0
Benzene	0.7
Total	**35.6**

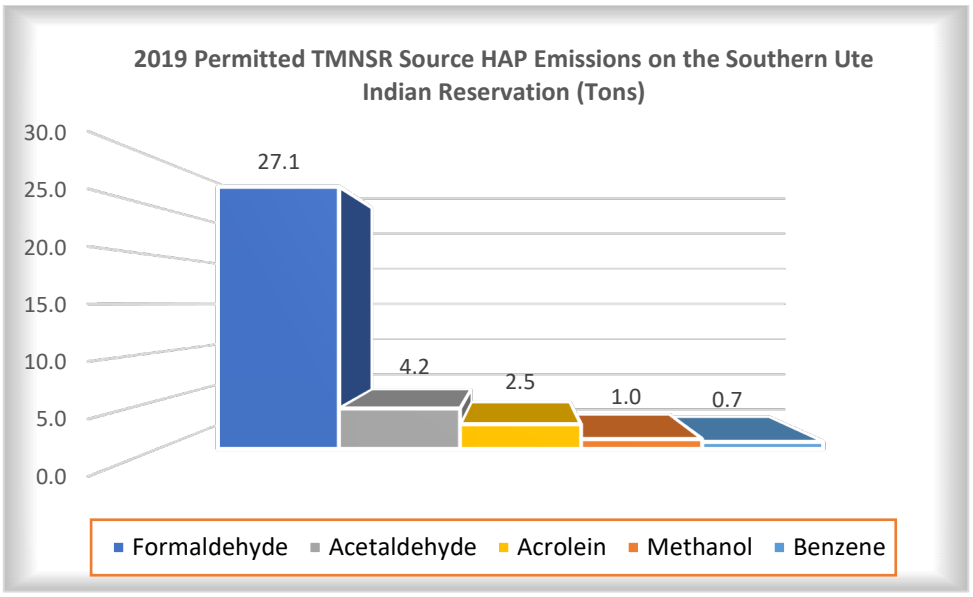

Figure 14: 2019 Speciated HAP Emissions at Permitted TMNSR Sources on the Southern Ute Indian Reservation [Tons]

Total 2019 HAP emissions by equipment type from permitted TMNSR sources on the Reservation are displayed below in Figure 15.

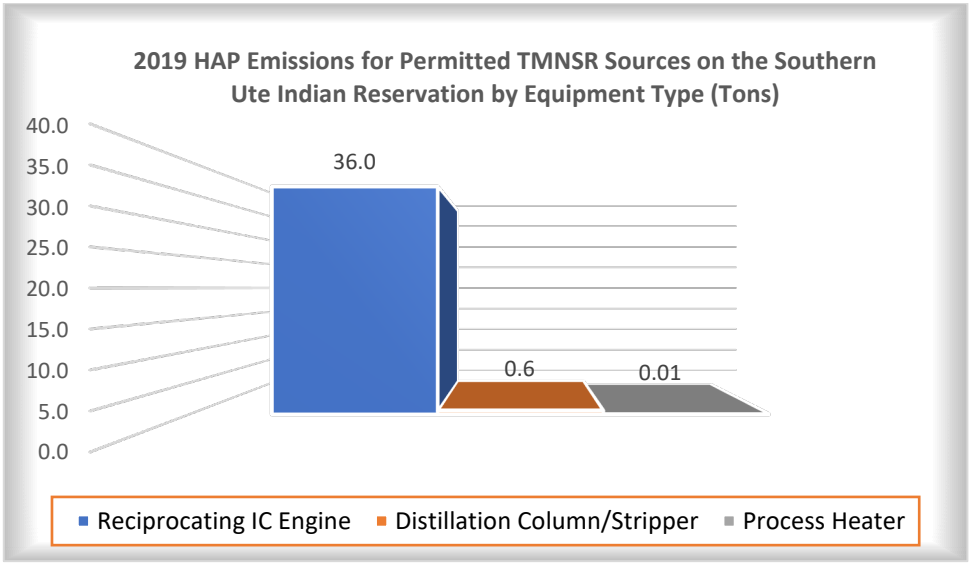

Figure 15: 2019 Total HAP Emissions for Permitted TMNSR Sources on the Southern Ute Indian Reservation by Equipment Type [Tons]

Permitted TMNSR equipment counts for the CY2019 inventory are displayed below in Figure 16.

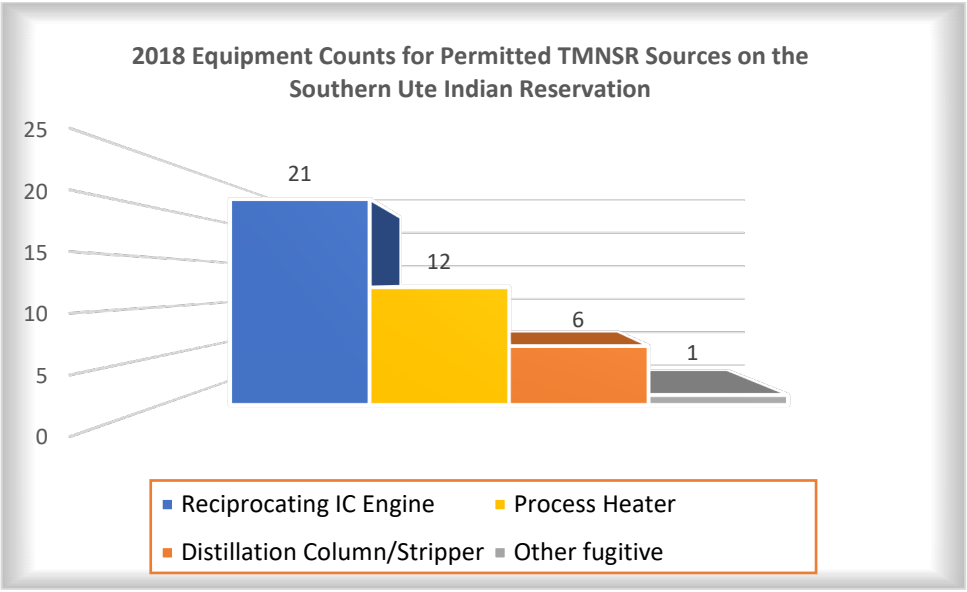

Figure 16: 2019 Equipment Counts for Permitted TMNSR Sources on the Southern Ute Indian Reservation

Summary

NO_x emissions represent the largest portion of criteria pollutant emissions from Synthetic Minor TMNSR permitted sources on the Reservation with 45% of the total criteria pollutant emissions. CO emissions represent the second largest pollutant emission with 29% of the total criteria pollutant emissions. Permitted TMNSR sources reported emissions from 40 pieces of equipment from four different categories (including others) with internal combustion engines being the most commonly reported equipment type. IC engines represented 52% of the total equipment reported. Proportionally high IC engine counts correlate with NO_x and CO emissions representing the majority of criteria pollutant emissions.

Formaldehyde emissions represent the largest portion of HAP emission from permitted TMNSR sources on the Reservation with 76% of the total HAP emissions on the Reservation. As previously stated, IC engines are the primary equipment type at permitted TMNSR sources and they account for most of the formaldehyde emissions in this source category.

V. QUALITY ASSURANCE SUMMARY

V.1 Quality Assurance Checks

Quality assurance (QA) checks were run through TEISS and through EPA's EIS. TEISS QA checks ensures the EI data contains all required components to submit to EIS. This includes facility, release point, emission unit, emission process, release point apportionment, reporting periods, and emissions. The CY2019 EI passed TEISS QA checks.

The EIS completes QA checks prior to submitting data for production. EI QA categorizes the data into "Total System Errors," Total Critical Errors," Total Protected Errors," "Total Warnings," and "Total Duplicates." The facility inventory and point inventory passed all QA without any errors and warnings.

Environmental Protection Agency performed QA comparisons on the CY2019 emission inventory. Emissions were compared to the finalized 2018 NEI and flagged if reported Tons were less than or greater than 25% of the 2018 NEI v2 amount. No emissions from the CY2019 emission inventory were flagged.

V.2 Criteria, HAP Pollutants and Equipment Count

Emissions from the CY2018 EI were compared to the CY2019 EI to ensure accuracy and identify possible inaccuracies. There was consistency in emissions records between the two years tested, with no greater than 25% difference found in emissions between the two years for criteria pollutants emitting more than 1000 tons (NOx, CO, and VOC), and the difference under 3% between the two years for criteria pollutants emitting less than or equal to 110 tons (PM10, and SO_2) during the CY2019 on the Southern Ute Indian Reservation. The difference in Total HAP emissions between the two compared years was 10%. All criteria pollutants and total HAP emissions showed a decrease in emissions between the two years. With the exception of SO_2.

Comparison of criteria pollutants and total HAP from CY2018 and CY2019 are displayed below in Figure 17.

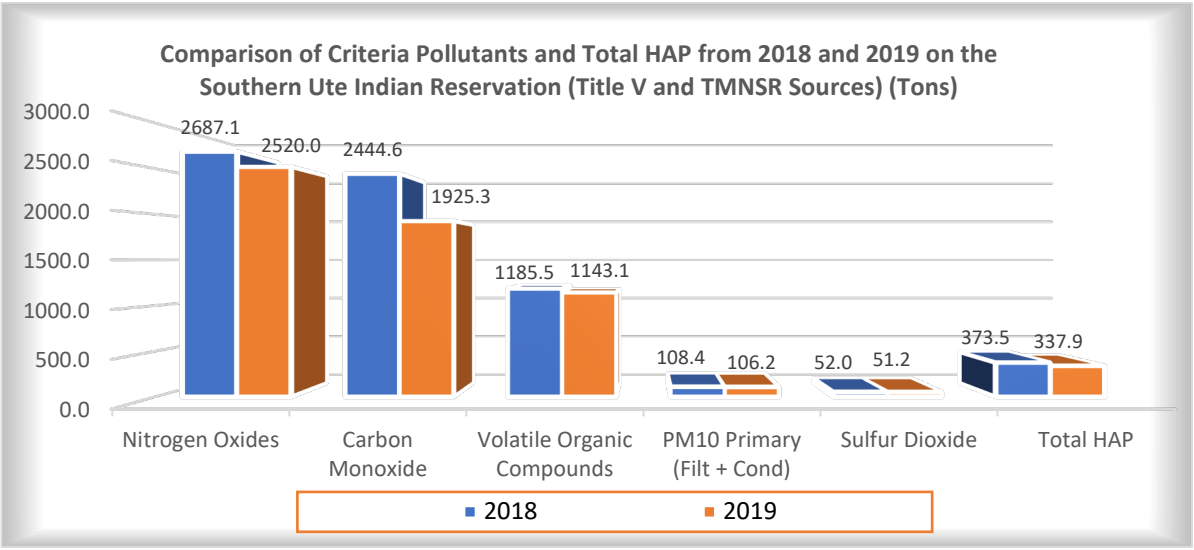

Figure 17: Comparison of Criteria Pollutants and Total HAP from CY2018 and CY2019 EI on the Southern Ute Indian Reservation

The AQP also compared equipment counts from the CY2018 EI and the CY2019 EI for Title V and Synthetic Minor TMNSR permitted sources. Equipment counts were consistently lower in CY2019 than in CY2018, with the exception of storage tanks.

Comparison of Title V and permitted TMNSR source equipment counts from the CY2018 and CY2019 is displayed below in Figure 18.

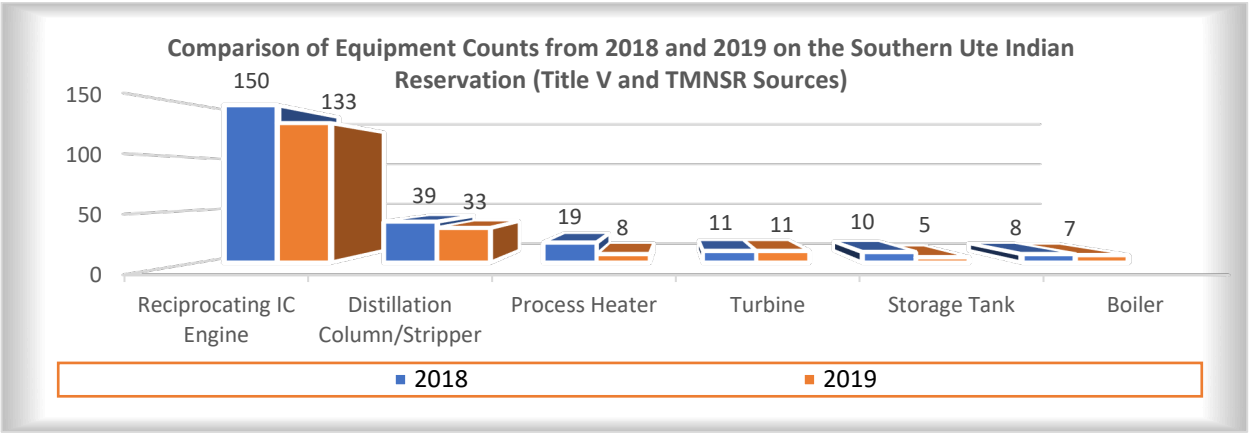

Figure 18: Comparison of Equipment Counts from 2018 and 2019 on the Southern Ute Indian Reservation (Title V and TMNSR Sources)

V.3 GHG

Total GHG Emissions from Title V Sources from CY2018 were compared to CY2019 to ensure accuracy and identify possible inaccuracies. A decrease of 36% was found in GHG emissions from the Title V and permitted TMNSR sources during the CY2019 from the CY2018 GHG levels, with the differences in Title V GHG emissions between the two years accounting for majority of the difference (99% of the difference).

Synthetic Minor TMNSR permitted sources do not report GHG emissions for emission fee calculations to the EPA. Therefore, CY2019 GHG data for permitted TMNSR sources were calculated using an emissions calculator tool developed by AQP which takes into account factors such as equipment type, equipment site rating, hours of operation, fuel consumption rate, emissions factors from EPA's AP-42 resources.

Figure 19 illustrates GHG emissions of Title V and Synthetic Minor TMNSR permitted sources for calendar years 2018 and 2019.

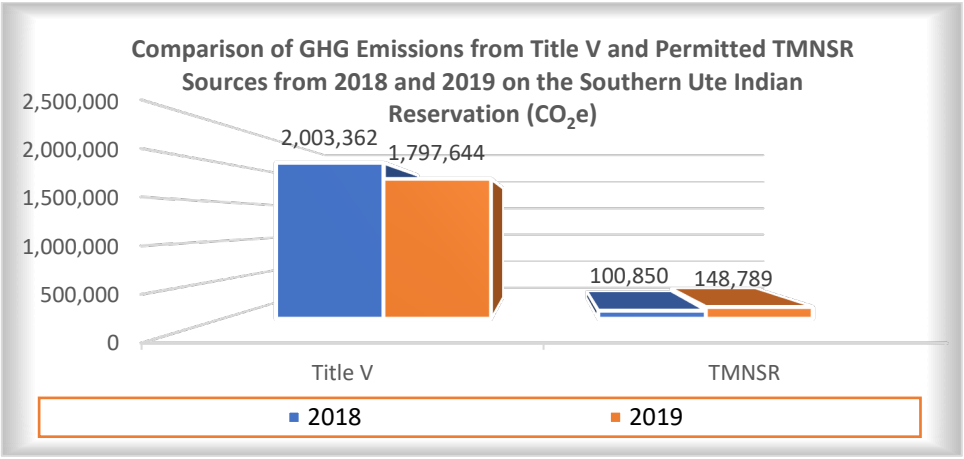

Figure 19: Comparison of GHG Emissions from Title V and Permitted TMNSR Sources from 2018 and 2019 on the Southern Ute Indian Reservation (CO_2e)

V.4 CY2019 Emission Summary

Table 5 summarizes the emissions from and Title V and Synthetic Minor TMNSR permitted sources on the Reservation during CY2019. NOx, CO and VOC represent dominant pollutants on the reservation of the pollutants and Title V sources account for majority of emissions.

Table 5: 2019 Criteria Pollutants, HAP, and GHG Emissions on the Southern Ute Indian Reservation [Tons]

	Oxides of Nitrogen	Carbon Monoxide	Volatile Organic Compounds	PM10 Primary (Filt + Cond)	Total HAP	CO2e
Title V	2,155.0	1,692.2	982.9	99.7	294.7	1,797,643.5
TMNSR	365.0	233.1	160.2	6.5	43.2	148,788.8
Total	**2,520.0**	**1,925.3**	**1,143.1**	**106.2**	**337.9**	**1,946,432.3**

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