GRIC Air Emissions Inventory Development

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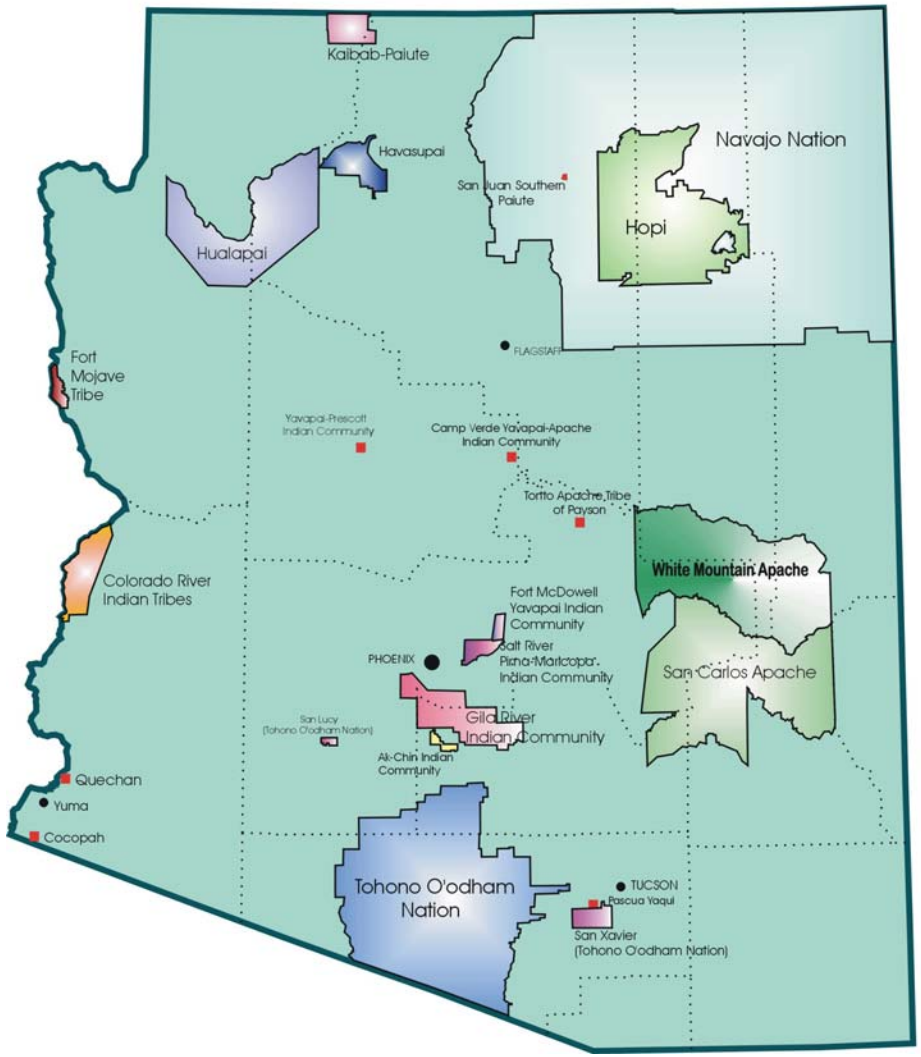
Gila River Indian Community (GRIC)

Department of Environmental Quality

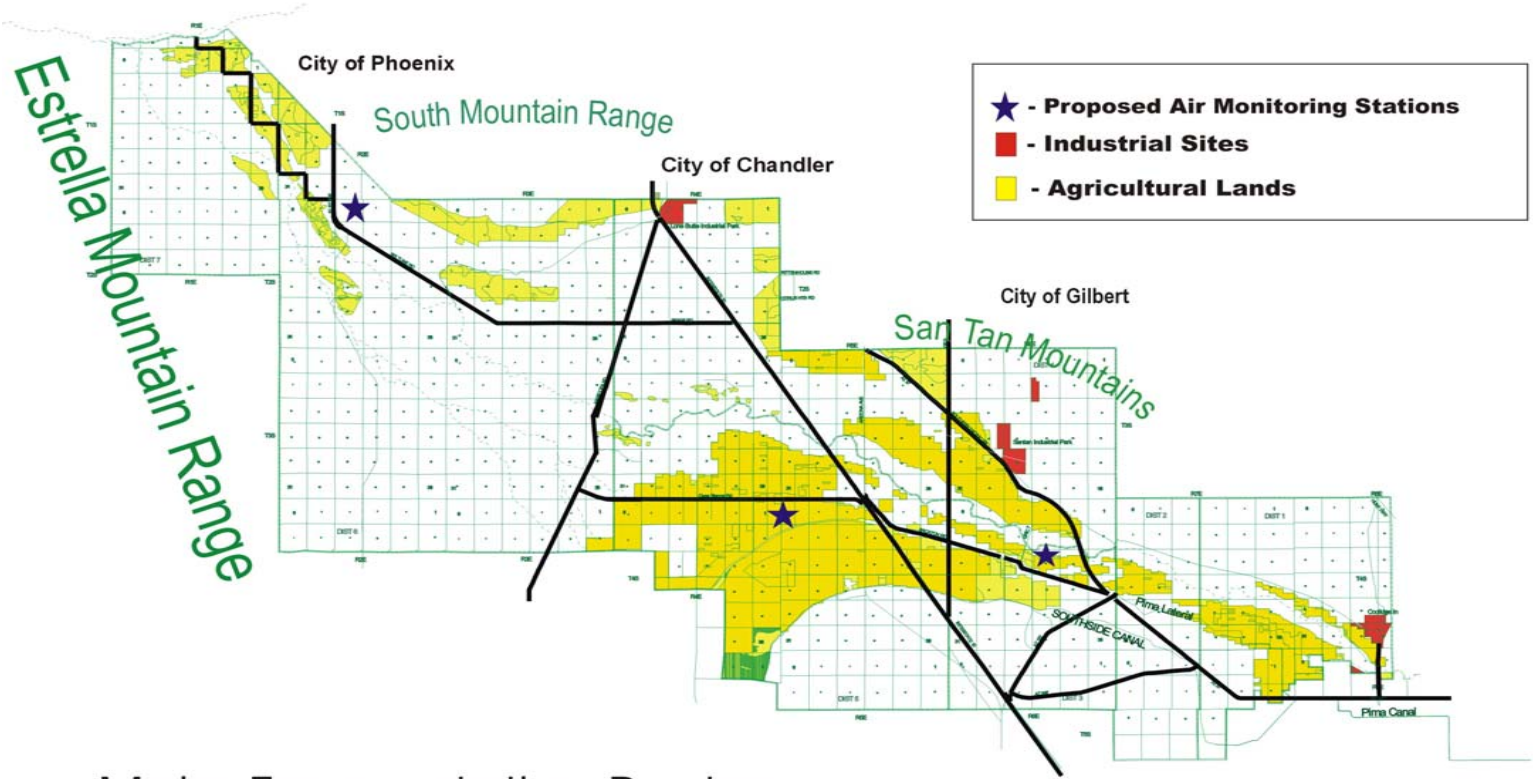
Background: Gila River Indian Community

- Central Arizona, adjacent to Phoenix
- Akimel O'odham (Pima) & Pee Posh (Maricopa)
- Located in Maricopa & Pinal counties
- Established in 1859 by Executive Order
- 374,000 acres
- Population 15,500 people (on-reservation)

Indian Reservations in Arizona



Gila River Indian Community



Major Transportation Routes

Industrial Facilities

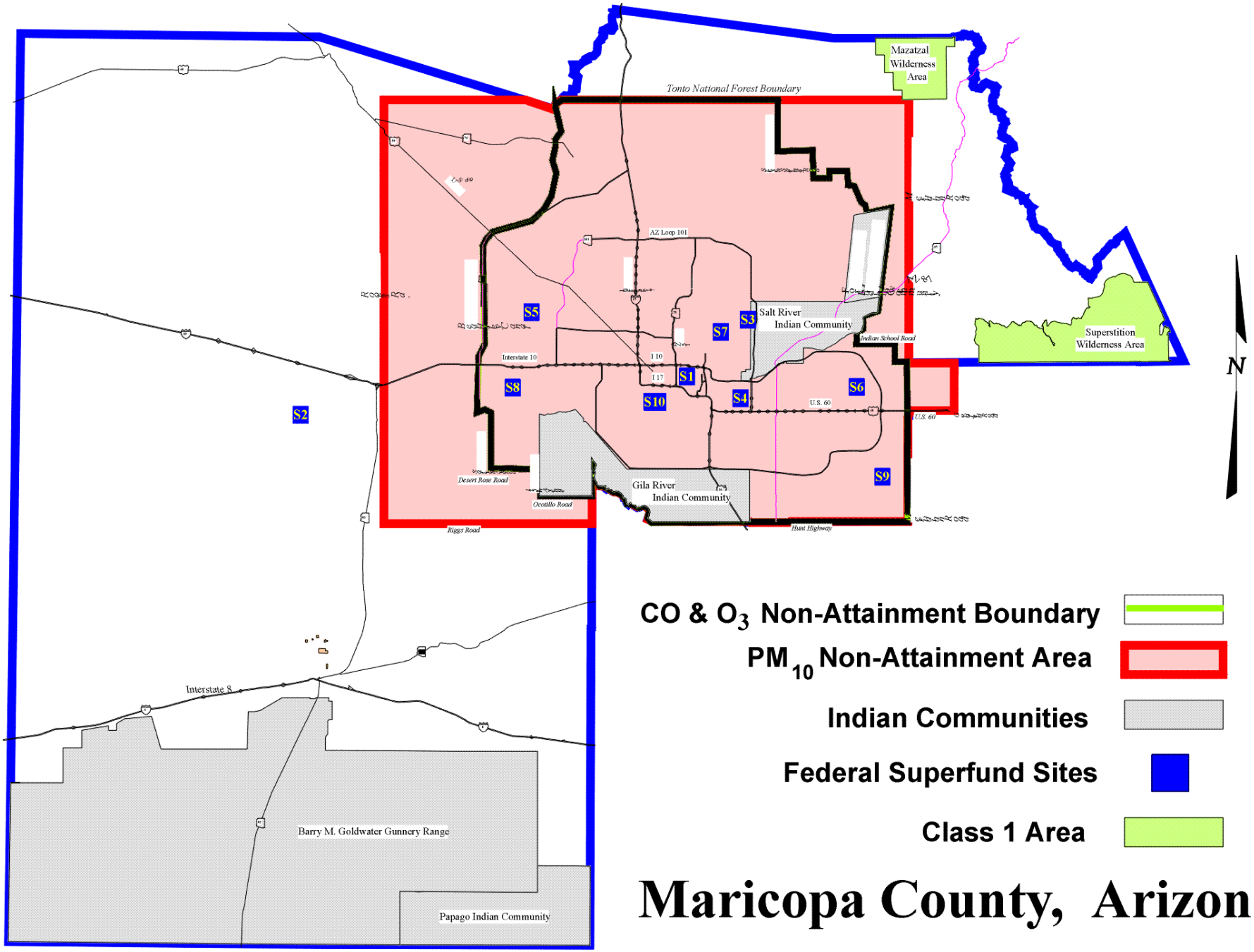
- **Three industrial parks, 45 businesses & industries**
  - Medical waste incinerator (decommissioned)
  - Aluminum-extrusion plants (3)
  - Hazardous-waste TSD
  - Explosive manufacturer
  - Sand and gravel plants (3)

Industrial Facilities (cont.)

- Cotton Gin & delinting plants
- Agricultural chemical supply (3)
- Turbine test facility
- Concrete block manufacturer
- Mobile home manufacturer
- Aerospace manufacture/rework facility

Other GRIC-Area Sources

- 40,000 agricultural acres
- Acreage will increase to 140,000 over next 10 years
- Interstate 10 bisects Community (largest source of air pollution)


Mazatzal Wilderness Area
Tonto National Forest Boundary
AZ Loop 101
Salt River Indian Community
Superstition Wilderness Area
Indian School Road
Interstate 10
I 10
I 17
U.S. 60
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
Desert Rose Road
Ocotillo Road
Riggs Road
Gila River Indian Community
Hunt Highway
Interstate 8
Barry M. Goldwater Gunnery Range
Papago Indian Community
N
CO & O3 Non-Attainment Boundary
PM10 Non-Attainment Area
Indian Communities
Federal Superfund Sites
Class 1 Area
Maricopa County, Arizona

GRIC Designations

- **GRIC was designated Non-Attainment in 1970s for CO, Ozone (1-hour) and PM_{10}**
- **GRIC submitted designation recommendation for 8-hour ozone standard (July 2003)**
- **EPA Designated GRIC attainment/unclassifiable under 8-hour standard and made GRIC a separate Air Quality Management Area (April 2004)**

GRIC Designations

- **Non-attainment area boundaries revised under CO NAAQS and GRIC designated attainment/unclassifiable Oct. 2004**
- **Non-attainment area boundaries revised under 1-hour ozone NAAQS and GRIC designated as attainment/unclassifiable March 2005**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GRIC Emissions Inventory

- GRIC Air Quality Program began in 1997
- Received 103 Assistance Grant
- Needs assessment (identify sources, need for air program)
- Emissions Inventory

GRIC Emissions Inventory

- **Identified a list of Air Pollution Sources**
  - 18 Stationary Point Sources (> 5 tpy of a criteria pollutant)
  - Area sources (< 5 tpy of a criteria pollutant)
  - Nonroad Mobile Sources
  - Onroad Mobile Sources
  - Natural Sources (Nonanthropogenic)

GRIC Emissions Inventory

- Sonoran Desert terrain light scrub and cactus
- 1200 to 1400 ft elevation
- temperature >115ºF to 20ºF
- Annual precipitation 6”-8”
- High winds up to 60mph during monsoon season

GRIC Emissions Inventory

- **Methodologies**
  - AP-42 Emission Factors
  - Mass Balance Equations
  - Source Test Data
  - Best Engineering Estimates
  - CARB Emission Factors and Methodologies
  - Maricopa County Emission Factors
  - ADEQ Emission Factors

GRIC Emissions Inventory

- Methodologies
  - Mobile source emissions calculated using Mobile 5b modeling program (CO, NOx, VOCs
  - Part 5 used to estimate particulate and SOx emission from vehicle exhaust
  - AP-42 equations used to estimate PM_{10} from paved and unpaved roads
  - Vehicle counts and road mileage provided by ADOT, GRIC DOT and MAG

GRIC Emissions Inventory

- Methodologies
  - Emissions from open burning calculated using burn permits issued, estimated household wood usage (elderly assistance) and Maricopa County methodologies
  - Household fuel burning calculated using quantities of LPG delivered to homes by two companies (large # of homes are all electric)

GRIC Emissions Inventory

- Methodologies
  - Agricultural PM_{10} emissions from tillage and harvesting calculated using BIA and GRIC acreage counts and Maricopa County methodologies
  - Windblown PM_{10} emissions for Ag. calculated using BIA and GRIC acreages CARB methodology and soil types from San Joaquin Valley

GRIC Emissions Inventory

- Methodologies
  - PM_{10} emissions from construction/ earthmoving operations were not calculated due to lack of these activities.
  - Development has increased dramatically since the initial EI and this category of emission source would be expected to increase.

GRIC Emissions Inventory

- EI Calculations From Industrial Sources
  - Air Quality Specialist visited most industrial facilities and gathered data
  - Used AP-42 EFs, Mass Balance calculations, engineering estimates or performance test data to calculate emissions.
  - Used Emission inventories developed by individual facilities
  - Compiled data into charts for PM_{10}, CO, NOx, VOCs and SOx

GRIC Emissions Inventory

- **Non-Road mobile Source**
  - Emissions from marine vessels, recreational vehicles, lawn equipment and construction equipment were not addressed (no activity)
  - Emissions from Ag. Operations was addressed using Maricopa County methodology

GRIC Emissions Inventory

- **On-road Mobile Sources**
  - Collected vehicle data from ADOT, GRIC DOT, BIA, and Maricopa County Road Dept.
  - Calculated VMT for most roads
  - Some vehicle counts were not available for unpaved roads (estimated)
  - Ran two separate mobile 5b models(1 with IM-240 credits, non-attainment, 1 without, attainment

GRIC Emissions Inventory

- **GRIC Emission Inventory Data separated into:**
  - Non-attainment Area Emissions Inventory (Maricopa County portion of GRIC)
  - Attainment Area Emissions Inventory (Pinal County portion of GRIC)

GRIC Emissions Inventory

- **Stumbling Blocks Encountered During Development of the GRIC Emissions Inventory**
  - Lack of sufficient data from Industrial facilities
  - Lack of Emission Factors (dragsters/turbines)
  - Problems with running Mobile 5b (MAG Assistance)
  - Limited vehicle traffic for unpaved roads

GRIC Emissions Inventory

- **Quality Assurance**
  - Emission estimates double checked for reasonableness and completeness
  - Emissions calculations were double and triple checked and EFs were compared to Source Classification Codes (SCC) and process description

GRIC Emissions Inventory

- **Conclusion**
  - GRIC EI completed October 1998
  - EI information used as a basis for a continuing air quality program at GRIC
  - EI used for establishing Air Quality Monitoring Network
  - EI used as a basis for the GRIC Tribal Implementation Plan (TIP)
  - Expect to complete new EI using the TEISS Data Base