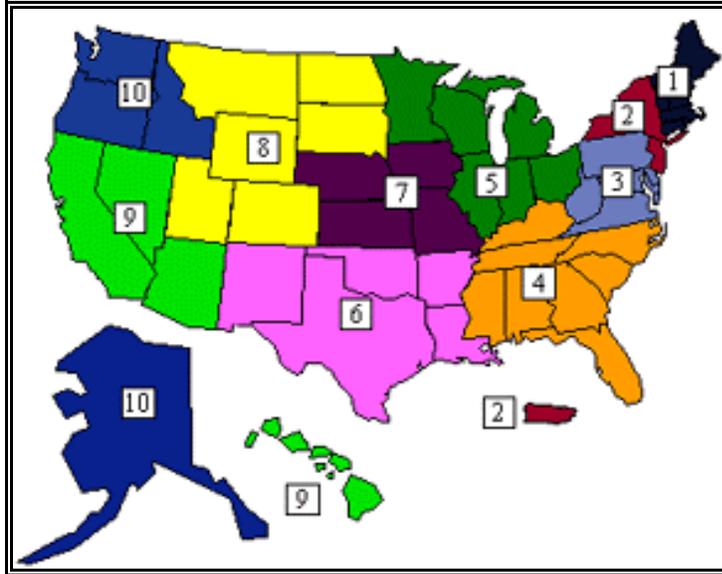


Appendix A

Tribal Contacts at EPA

**EPA
Regional Office
Jurisdictions**



EPA Regional Offices Tribal Programs Web Sites

Region 1	www.epa.gov/region01/govt/tribes/index.html
Region 2	www.epa.gov/region2/nations/indian1.htm
Region 3	www.epa.gov/region03/
Region 4	www.epa.gov/region4/ead/GovPartners/tribal.htm
Region 5	www.epa.gov/reg5oop/tribes
Region 6	www.epa.gov/earth1r6/6xa/tribal/tribal.htm
Region 7	www.epa.gov/region07/
Region 8	www.epa.gov/region8/tribes/
Region 9	www.epa.gov/region09/cross_pr/indian/index.html
Region 10	http://yosemite.epa.gov/r10/tribal.NSF/webpage/tribal+office+homepage?opendocument

EPA Tribal Contacts

Region	Name & Address	Phone & Fax	Email
1	Ida Gagnon Environmental Engineer Air Permits Program 1 Congress Street Suite 1100 (CAP) Boston, MA 02114-2023	(617) 918-1653 (P) (617) 918-1505 (F)	gagnon.ida@epa.gov
2	Mazeeda Khan 290 Broadway, 26 th Floor New York, NY 10007-1866	(212) 637-3517 (P)	kahn.mazeeda@epa.gov
3	Air Protection Division	(215) 814-2100	
4	Darren Palmer Environmental Scientist Air Permits Section Atlanta Federal Center 61 Forsyth Street Atlanta, GA 30303-3104	(404) 562-9052 (P)	palmer.darren@epa.gov
5	Ben Giwojna (Dino Blathras) AR-18J 77 West Jackson Blvd. Chicago, IL 60604-3507	(312) 886-0247 (P)	giwojna.benjamin@epa.gov
6	Dick Thomas (Tony Talton) Air Tribal Coordinator Fountain Place 1445 Ross Ave. Dallas, TX 75202-2733	(214) 665-8528 (P) (214) 665-6762 (F)	thomas.richardm@epa.gov
7	Judith Robinson ARTD/APDB Tribal Air Program Coordinator 726 Minnesota Kansas City, KS 66101-2728	(913) 551-7825 (P) (913) 551-7844 (F)	robinson.judith@epa.gov

Region	Name & Address	Phone & Fax	Email
8	Monica Morales (Bernadette Gonzalez) 8P-AR Environmental Engineer/ Tribal Air Coordinator Air and Radiation Program 999 18 th St., Suite 300 Denver, CO 80202	(303) 312-6936 (P) (303) 312-6064 (F)	morales.monica@epa.gov
9	Doug McDaniel (Sara Bartholomew) Tribal Team Leader Air Division 75 Hawthorne St. (AIR-8) San Francisco, CA 94105	(415) 744-1246 (P) (415) 744-1076 (F)	mcdaniel.doug@epa.gov
10	Regina Thompson (Mary Manous) Tribal Air Program Development 1200 Sixth Ave (OAR-107) Seattle, WA 98101	(206) 553-1498 (P) (206) 553-1059 (P)	thompson.regina@epa.gov
National	Darrel Harman Office of Air and Radiation National Tribal Coordinator 401 M Street SW - 6101 Washington, DC 20460	(202) 564-7416 (P)	
National	Laura McKelvey Office of Air Quality Planning and Standards Tribal Coordinator C504-01 Research Triangle Park, NC 27713	(919) 541-5477 (P)	mckelvey.laura@epa.gov
National	Julie McClintock Office of Air Quality Planning and Standards Tribal Programs C539-02	(919) 541-5339 (P)	mcclintock.julie@epa.gov

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Appendix B

Informational Resources

Description	Website and/or Other Sources of Information
Starting Points	
American Indian Environmental Office (AIEO)	www.epa.gov/indian
Institute for Tribal Environmental Office	www.cet.nau.edu/itep/
American Indian Science and Engineering Society (AISES)	www.aises.org
General Law	
The Clean Air Act (CAA)	www.epa.gov/oar/caa/contents.html
Plain English Guide to the CAA	www.epa.gov/oar/oaqps/peg_caa/pegcaain.html
Code of Federal Regulations (CFR)	www.access.gpo.gov/nara/cfr/index.html
Text of 40 CFR (environmental regulations)	www.epa.gov/docs/epacfr40
Tribal Authority Rule (TAR)	63 Federal Register 7254 40 CFR parts 9, 35, 49, 50, and 81 www.epa.gov/oar/tribal/airprogs/authrule/http://laws.findlaw.com/dc/981196a.html
Laws, regulations, and guidance of special interest to tribes	www.epa.gov/indian/regulate.htm
National Ambient Air Quality Standards (NAAQS)	40 CFR 50 www.epa.gov/airs/criteria.html www.epa.gov/ttn/oarpg/t1main.html
Memoranda for NAAQS - Policy & Guidance Memos	www.epa.gov/ttn/oarpg/t1pgm.html
Reports for NAAQS - Background Information Documents	www.epa.gov/ttn/oarpg/t1bid.html

Description	Website and/or Other Sources of Information
State implementation plan (SIP) requirements	CAA Section 110(a) 40 CFR parts 51 and 52
Criteria used to determine the administrative completeness of implementation plans	40 CFR 51 Appendix V
Ozone nonattainment area requirements	CAA Sections 181 through 185
Carbon monoxide nonattainment area requirements	CAA Sections 186 and 187
PM nonattainment area requirements	§188 to §190
Sulfur oxide, lead, or nitrogen oxide nonattainment area requirements	CAA Sections 191 and 192
Nonattainment areas	www.epa.gov/airs/nonattn.html www.epa.gov/oar/oaqps/greenbk/index.html
Section 126 petitions to EPA to find that sources outside your reservation are contributing to NAAQS violations	www.epa.gov/ttn/rto/126/
Redesignation from nonattainment to attainment	CAA Section 107(d)(3)(E)
Emissions Inventories	
Emissions Inventory Improvement Program (EIIP)	www.epa.gov/ttn/chief/eiip/
<i>EIIP Document Series, Volumes I-IX</i> - the primary guidance on inventory development	www.epa.gov/ttn/chief/eiip/ or the National Technical Information Service (www.ntis.gov/ or (703) 605-6000)
ClearingHouse for Inventories and Emissions Factors (CHIEF)	www.epa.gov/ttn/chief
<i>Handbook for Criteria pollutant Inventory Development: A Beginner's Guide for Point and Area Sources</i>	www.epa.gov/ttn/chief (reference number EPA-454/R-99-037)
The Institute for Tribal Environmental Professionals	www.cet.nau.edu/itep

Description	Website and/or Other Sources of Information
<i>The Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter NAAQS and Regional Haze Regulations</i> , April 1999	www.epa.gov/ttn/chief/txt/eidocfml.pdf (reference number EPA-454/R-99-006)
AP-42, <i>Emission Factors Handbook</i> - includes brief descriptions of processes used, potential sources of air emissions from the processes, common methods used to control these air emissions, and methodologies for estimating the quantity of air pollutant emissions via emission factors	www.epa.gov/ttn/chief/ap42.html#chapter
Air Quality Monitoring	
Information on existing air quality monitoring stations	www.epa.gov/oar/oaqps/qa/monprog.html
The Aerometric Information Retrieval System - Air Quality System (AIRS-AQS) - a database with information on the levels of the criteria pollutants in all areas of the country	www.epa.gov/airs/
Ambient Monitoring Technology Information Center	www.epa.gov/ttn/amtic
Air Pollutant Monitoring website	www.epa.gov/oar/oaqps/montring.html
The Tribal Air Monitoring Support Center	www.cet.nau.edu/itep/TAMS/TAMS_default.htm
<i>Quality Assurance Handbook for Air Pollutant Measuring Systems: Volume 1-Principles</i>	Ordering information: www.epa.gov/ncepihom/Catalog/EPA600R94038 A.html or 1-800-490-9198
<i>Quality Assurance Handbook for Air Pollutant Measuring Systems: Volume 3-Stationary Source-Specific Methods</i>	Ordering information: www.epa.gov/ncepihom/Catalog/EPA600R94038 C.html or 1-800-490-9198
Data analysis requirements	40 CFR 50 www.epa.gov/ttn/oarpg/t1pgm.html
Control Measures	

Description	Website and/or Other Sources of Information
Clean Air Technology Center (CATC) - a resource on all areas of emerging and existing air pollution prevention and control technologies, and information on their use, effectiveness, and cost	www.epa.gov/ttn/catc/
NSR RACT/BACT/LAER Clearinghouse	http://209.42.208.109/rblc/htm/bl02.htm
<i>Procedures for Identifying Reasonably Available Control Technology for Stationary Sources of PM₁₀</i> (EPA 452/R-93-001), September 1992	www.epa.gov/ttn/catc/products/html
Air Quality Modeling	
Support Center for Regulatory Air Models	www.epa.gov/ttn/scram/
Emissions Measurement	
Emission Measurement Center (EMC)	www.epa.gov/ttn/emc/ or the EMC 24-hr automated telephone information hotline: (919) 541-0200
EMC's promulgated test methods site	www.epa.gov/ttn/emc/promgate.html
Enforcement	
Office of Enforcement and Compliance Assurance (OECA)	http://es.epa.gov/oeca/
OECA's Compliance Assistance Centers for specific industry sectors	http://es.epa.gov/oeca/main/compasst/compcenters.html
National Enforcement Training Institute (NETI)	www.epa.gov/oeca/neti or call 1-800-EPA-NETI
American Indian Lands Environmental Support Project (AILESP) - a database with release, compliance and enforcement histories for facilities located on and within five kilometers of tribal lands	http://es.epa.gov/oeca/ailesp/

Description	Website and/or Other Sources of Information
BEN - a computer model for determining the economic benefits gained by a source for avoiding or delaying required environmental expenditures	http://es.epa.gov/oeca/models/ben.html
Miscellaneous	
Criteria pollutants - general information	www.epa.gov/oar/aqtrnd97/brochure/sixprin.html
New Source Review	www.epa.gov/ttn/nsr/
Visibility / Regional Haze Program	www.epa.gov/oar/vis/index.html
<i>Tribal Environmental and Natural Resources Assistance Handbook</i> - a central location of federal resources of both technical and financial assistance available to tribes for environmental management	www.epa.gov/indian/tribook.pdf
<i>Developing a Tribal Air Program, Training Manual</i> (April 1999) - information on public relations campaigns and other topics relating to air program development	Institute for Tribal Environmental Professionals at Northern Arizona University at (520) 523-9555 and ITEP-L@lists.nau.edu (e-mail); US EPA Region 6
Office of Air and Radiation, TribalAIR	www.epa.gov/oar/tribal/
State and Territorial Air Pollution Program Administrators (STAPPA) and Association of Local Air Pollution Control Officers (ALAPCO) - national associations representing air pollution control agencies across the United States	www.4cleanair.org
National Tribal Environmental Council (NTEC) - a membership organization dedicated to working with and assisting tribes in the protection and preservation of the reservation environment	www.ntec.org

Description	Website and/or Other Sources of Information
National Service Center for Environmental Publications (NSCEP) - has over 5000 EPA publications available in hard copy and multimedia product, free of charge	www.epa.gov/ncepihom/

Appendix C

Education and Training Resources

Resource	Contact Information
<p>Air Pollution Training Institute (APTI) - offers classroom, telecourse, self-instructional courses, and web-based learning, links to some of which are provided below</p>	<p>www.epa.gov/oar/oaqps/eog/apti.html (919) 515-4265 (phone) (919) 541-5678 (fax)</p>
<p>APTI Area Training Centers - classroom courses and training opportunities</p>	<p>www.epa.gov/oar/oaqps/eog/atcacad.html</p> <p><u>Area Training Centers</u> Rutgers (Univ. of NJ), New Brunswick: (732) 932-8065 Univ. of IL, Chicago: (312) 996-2094 CA Polytechnic State, San Luis Obispo: (805) 756-2559 Univ. of So. FL, Tampa: (813) 974-5815</p> <p><u>Specialized Training Centers</u> Environmental & Occupational Health Sciences Institute, Piscataway, NJ: (732) 445-0220 Environmental Training Institute, Univ. of OH, Cincinnati: (513) 556-2542 Air Pollution Training Academy, Univ. of TX, Arlington: (817) 272-2915</p>
<p>APTI OL:2000 - an online reference manual with reading material and problems on fundamental engineering principles and concepts, permit review, compliance monitoring and inspection, and CAA regulatory requirements</p>	<p>www.epin.ncsu.edu/apti/ol_2000/home/homefram.htm</p>
<p>EPA Education and Outreach Group (EOG) - provides APTI courses and a variety of other air training events, links to some of which are provided below</p>	<p>www.epa.gov/oar/oaqps/eog/catalog/ccs2.html</p>

Resource	Contact Information
EOG Air Pollution Distance Learning Network (APDLN) - provides seminars and telecourses via satellite broadcasts to over 100 governmental and university affiliates	www.epa.gov/oar/oaqps/eog/apdln.html (919) 541-5455 (phone) (919) 541-5678 (fax)
EOG self-instructional courses - both introductory and advanced courses are available	www.epa.gov/oar/oaqps/eog/catalog/catsic.html (919) 515-5875
Institute for Tribal Environmental Professionals (ITEP) - provides technical and administrative training (the <i>American Indian Air Quality Training Program</i>), a resource center and database (the <i>Tribal Environmental Resource Center</i>), outreach to schools, and professional and student internships	www.cet.nau.edu/itep/default.htm (520) 523-9555
Tribal Air Monitoring Support Center (TAMS) - provides hands-on training and support services for tribal air professionals on the topic of air quality monitoring	www.cet.nau.edu/itep/TAMS/TAMS_default.htm (702) 798-2559

Appendix D

Information on Criteria Pollutants

SO ₂	What is it?	<ul style="list-style-type: none"> » Sulfur dioxide (SO₂) belongs to a family of gases called sulfur oxides (SO_x). » SO₂ is released during the burning or processing of sulfur-containing ores and fossil fuels.
	Health Effects	<ul style="list-style-type: none"> » SO₂ contributes to respiratory illness. » SO₂ aggravates asthma, bronchitis, emphysema, cardiovascular problems.
	Environmental Effects	<ul style="list-style-type: none"> » Acid rain occurs when SO₂ and NO_x react with water and oxygen; Acid rain harms lakes and streams, and damages trees, crops, historic buildings, and monuments. » SO₂ contributes to visibility impairment in large parts of the country by contributing to haze.
	Common Emission Sources	<ul style="list-style-type: none"> » Utility & industrial boilers » Primary and secondary copper & lead smelters » Petroleum refineries » Aluminum smelters » Phosphate fertilizer manufacturing » Diesel vehicles » Iron & steel mills » Crude petroleum & natural gas extraction processes » Carbon black manufacturing » Sulfuric acid plants » Portland cement manufacturing » Pulp and paper mills
NO ₂	What is it?	<ul style="list-style-type: none"> » Nitrogen dioxide (NO₂) belongs to a family of gases called nitrogen oxides (NO_x). » NO₂ is released when fossil fuels are burned and from high temperature processes. » NO₂ can react in the presence of water and sunlight to become ozone (O₃).
	Health Effects	<ul style="list-style-type: none"> » O₃ causes damages lung tissue, reduces lung function and sensitizes the lungs to other irritants; it also irritates the eyes, nose, throat. » O₃ is especially bad for those with chronic heart and lung disease, as well as the very young and old, and pregnant women.

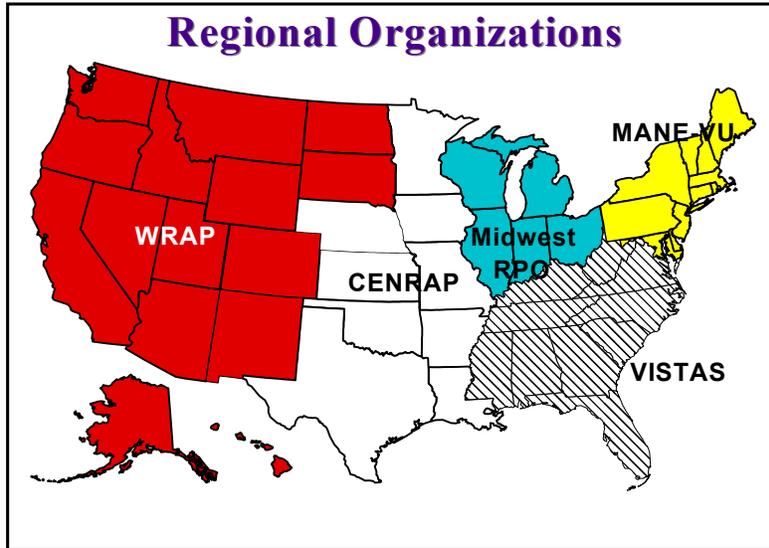
NO ₂ , cont.	Environmental Effects	<ul style="list-style-type: none"> » Acid rain occurs when SO₂ and NO_x react with water and oxygen; Acid rain harms lakes and streams, and damages trees, crops, historic buildings, and monuments. » O₃ is the main pollutant in smog. » NO_x can cause damage to plant foliage.
	Common Emission Sources	<ul style="list-style-type: none"> » Metallurgical furnaces » Blast furnaces » Plasma furnaces » Kilns » Fossil fuel power generation » On-road vehicles
O ₃	What is it?	<ul style="list-style-type: none"> » Ozone (O₃) is found in two layers of the atmosphere, the stratosphere and the troposphere. In the stratosphere (the atmospheric layer 7 to 10 miles or more above the earth's surface), ozone is a natural form of oxygen that provides a protective layer shielding the earth from ultraviolet radiation. In the troposphere (the layer extending up 7 to 10 miles from the earth's surface), ozone is formed through chemical reactions and is a major component of smog. Ozone in the troposphere is produced through complex chemical reactions of NO_x and volatile organic compounds (VOC) and sunlight. » Volatile organic compounds (VOC) are found in everything from paints and coatings to underarm deodorant and cleaning fluids. Areas in nonattainment for O₃ regulate NO_x and VOC emissions.
	Health Effects	<ul style="list-style-type: none"> » O₃ causes damages lung tissue, reduces lung function and sensitizes the lungs to other irritants; it also irritates the eyes, nose, throat. » O₃ is especially bad for those with chronic heart and lung disease, as well as the very young and old, and pregnant women.
	Environmental Effects	<ul style="list-style-type: none"> » O₃ is the main pollutant in smog. » VOC and NO_x can cause damage to plant foliage.
	Common Emission Sources	<ul style="list-style-type: none"> » Transportation sources » Power plants » Industrial boilers and industrial processes utilizing solvents, such as surface coating (paints) and printing (inks) » Petrochemical processing » Chemical manufacturing » Dry cleaners » Paint shops » Gasoline storage and transfer

CO	What is it?	<ul style="list-style-type: none"> » Carbon monoxide (CO) is a poisonous gas formed when carbon in fuels is not burned completely. » CO is a product of vehicle exhaust, which contributes about 77% of all CO emissions nationwide.
	Health Effects	<ul style="list-style-type: none"> » CO reduces oxygen delivery to organs and tissues. » CO affects cardiovascular and central nervous systems. » CO causes headaches, dizziness, nausea, and listlessness. » CO is associated with visual impairment, reduced work capacity and manual dexterity, poor learning ability, difficulty performing complex tasks, inability to discriminate time intervals, and in high doses, may cause death.
	Environmental Effects	<ul style="list-style-type: none"> » CO is believed to contribute to global climate change.
	Common Emission Sources	<ul style="list-style-type: none"> » On-road vehicles » Non-road sources (lawn & garden equipment, recreational marine equipment) » Non-transportation fuel combustion (i.e., wood burning) » Chemical & allied product mfg. (i.e., carbon black manufacturing) » Metals processing (i.e., ferrous metals)
Pb	What is it?	<ul style="list-style-type: none"> » Lead (Pb) is a naturally occurring substance. » Historically, the primary source of Pb emissions was lead additives in gasoline.
	Health Effects	<ul style="list-style-type: none"> » Pb causes damage to kidney, liver, brain, nervous system, and causes malformation of an embryo or fetus. » Pb is associated with heart disease, high blood pressure, anemic disorders, osteoporosis, reproductive disorders, memory problems, fatigue, and mood changes. » Infants and young children are especially susceptible to low doses of Pb, and this age group still shows the highest levels.
	Environmental Effects	<ul style="list-style-type: none"> » Pb can inhibit photosynthesis and reduce growth in plants. » Pb can lead to changes in species composition as plant and microbial communities become lead-tolerant. » Pb can accumulate in the environment and travel up the food chain and be ingested by humans.

	Common Emission Sources	<ul style="list-style-type: none"> » Lead smelters » Iron & Steel production » Mining » Waste incineration » Lead alkyl manufacturing » Battery manufacturing » Pigment manufacturing » Fuel combustion (i.e., utility, industrial, other)
PM	What is it?	<ul style="list-style-type: none"> » Particulate matter (PM) is solid or liquid material suspended in the atmosphere (i.e., pieces of ash, smoke, soot, dust, and liquid droplets). » PM is directly emitted or formed in the air. » PM is characterized by coarse and fine size fractions: <ul style="list-style-type: none"> › PM₁₀ includes particles # 10 Fm in diameter › PM_{2.5} includes particles # 2.5 Fm in diameter
	Health Effects	<ul style="list-style-type: none"> » PM causes eye irritation and accumulates in lungs, contributing to damaged lung tissue, decreased lung function, aggravated asthma, acute respiratory symptoms, increased hospital visits, increased frequency in childhood illness such as chronic bronchitis, premature death » Children, asthmatics, elderly, and individuals with pre-existing cardiovascular and respiratory illness are especially sensitive populations.
	Environmental Effects	<ul style="list-style-type: none"> » PM contributes to visibility impairment in large parts of the country by contributing to haze.
	Common Emission Sources	<ul style="list-style-type: none"> » Paved and unpaved roads » Construction activities » Burning » Mineral product manufacturing » Waste disposal and recycling » Fuel combustion (utilities, industrial) » Industrial processes (metals processing, oil refining)

Appendix E

A Guide to Regional Air Quality Planning Organizations



Name	Contact Information	Member Governments
Mid-Atlantic/Northeast Visibility Union (MANE-VU)	Bruce Carhart 444 N. Capitol St. NW Suite 638 Washington, DC 20001 (202) 508-3840 http://www.sso.org/otc/regional_haze/regionalhaze.htm#Formal%20Actions	Connecticut Delaware Maine Maryland Massachusetts New Hampshire New Jersey New York Pennsylvania Penobscot Indian Nation Rhode Island St. Regis Mohawk Tribe U.S. Environmental Protection Agency U.S. Fish and Wildlife Service U.S. Forest Service U.S. National Park Service Vermont Washington, DC

Name	Contact Information	Member Governments
Visibility Improvement State and Tribal Association of the Southeast (VISTAS)	William P. (Phil) Brantley 2600 Bull St. Columbia, SC 29201 (803) 898-4116 http://www.vistas-sesarm.org/	Alabama Catawba Indian Nation Eastern Band of the Cherokee Indians Florida Georgia Kentucky Miccosukee Tribe of Indians of Florida Mississippi Mississippi Band of Choctaw Indians North Carolina Seminole Indian Tribe of Florida South Carolina Tennessee U.S. Environmental Protection Agency U.S. Fish and Wildlife Service U.S. Forest Service U.S. National Park Service Virginia West Virginia

Name	Contact Information	Member Governments
Midwest RPO	Mike Koerber 2250 East Devon Ave. Suite 216 Des Plaines, IL 60018 (847) 296-2181 http://www.ladco.org/rpo/rpo.html	Bad River Band of Lake Superior Chippewa Bay Mills Indian Community Bois Forte Reservation Business Committee Fond du Lac Reservation Business Committee Forest County Potawatomi Community Grand Portage Reservation Business Committee Grand Traverse Band of Ottawa and Chippewa Great Lakes Indian Fish & Wildlife Great Lakes Inter-Tribal Council Hannahville Indian Community Ho Chunk Nation Illinois Indiana Intertribal Council of Michigan Keweenaw Bay Indian Community Lac Courte Oreilles Band of Lake Superior Chippewa Lac du Flambeau Band of Lake Superior Chippewa Lac Vieux Desert Band of Lake Superior Chippewa Leech Lake Reservation Business Committee Little River Band of Ottawa Little Traverse Bay Bands of Odawa Lower Sioux Indian Community Match-E-Be-Nash-She-Wish Band of Potawatomi Menominee Indian Tribe Michigan Mille Lacs Reservation Business Committee Minnesota Chippewa Nottawaseppi Huron Potawatomi Ohio Oneida Tribe Pokagon Band of Potawatomi

Name	Contact Information	Member Governments
Midwest RPO (cont.)		Shakopee Mdewakanton Sioux Community Sokaogon Chippewa (Mole Lake) Community St. Croix Chippewa Stockbridge-Munsee Community Upper Sioux Community U.S. Environmental Protection Agency U.S. Fish and Wildlife Service U.S. National Park Service White Earth Reservation Business Community Wisconsin
Central Regional Air Planning Association (CENRAP)	10015 S. Pennsylvania Suite A Oklahoma City, OK 73159 Larry Byrum (Virginia) (405) 378-7377 Bob Hanneschlager (214) 665-3188 http://www.cenrap.org/	Arkansas Iowa Kansas Louisiana Minnesota Missouri Nebraska Oklahoma Texas (Tribal membership in progress)

Name	Contact Information	Member Governments
Western Regional Air Partnership (WRAP)	<p>1515 Cleveland Pl. Suite 200 Denver, CO 80202</p> <p>Patrick Cummins, Western Governors' Association (303) 623-5635</p> <p>Bill Grantham, National Tribal Environmental Council (505) 242-2175 1-800-727-2175 www.wrapair.org</p>	<p>Arizona California Campo Band of Kumeyaay Indians Colorado Cortina Indian Rancheria Hopi Tribe Hualapai Nation of the Grand Canyon Idaho Jicarilla Apache Tribe Montana New Mexico North Dakota Northern Cheyenne Tribe Oregon Pueblo of Acoma Pueblo of San Felipe Salish and Kootenai Confederated Tribes Shoshone-Bannock Tribes of Fort Hall South Dakota U.S. Environmental Protection Agency U.S. Fish and Wildlife Service U.S. Forest Service U.S. National Park Service Utah Washington Wyoming</p>

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Appendix F

Emission Inventories

This appendix provides additional information on emission inventory development, including:

- » Different approaches toward inventory development
- » The types of sources to include in an inventory
- » The types of emissions to include in an inventory
- » The types of data to include in an inventory
- » EPA resources for emissions data, emissions factors, and emissions estimation methods

What approaches can be taken toward inventory development?

There are two main approaches you can follow in estimating emissions: top-down and bottom-up. Both approaches can be used in one inventory for estimating emissions from different types of sources.

1. *A Top-Down Approach* means that you develop emissions estimates based on national or regional estimates. You scale the national or regional estimates to your inventory area using some measure of activity data thought to be related to the emissions on your reservation. Sales data (such as the total amount of gasoline sold at a gas station) or per capita emission factors are often used.

A top-down approach is typically used to inventory area sources (see below) and is used when local data are unavailable or when collection of local data is cost-prohibitive. One problem with this approach is that the emission estimates will lose some accuracy due to the uncertainties associated with extrapolating national or regional estimates to your area.

2. *A Bottom-Up Approach* means you estimate emissions for individual sources and sum all the sources to obtain a reservation-wide estimate. Bottom-up approaches are typically used to inventory point sources, although they can be used to inventory area sources when resources are available to collect local activity data through a survey effort. The bottom-up approach requires more resources to collect site-specific information, but also results in more accurate estimates than the top-down approach because data are collected directly from individual sources.

What types of sources are included in an inventory?

An emission source can be defined as an entire facility, such as a petroleum refinery with many emission sites caused by process activities, or just a particular emission site within the

facility, such as one stack. Sources can also be smaller facilities such as gas stations and mobile sources such as cars. There are five categories of sources to include in an inventory: point sources, area sources, mobile sources, biogenic sources, and geogenic sources.

1. Point sources are stationary facilities that emit air pollutants. Examples of point sources include manufacturing facilities or electric utility sites. Air pollutants may be emitted from process activities through exhaust stacks or as fugitive emissions. Fugitive emissions are emission sources that do not come from an exhaust stack or vent and are technically infeasible to collect and control. Fugitive emissions may escape from industrial buildings or come from unconfined activities such as outdoor materials storage piles swept by wind and surface mining activities.

Point sources can be major or minor sources of emissions. The definition of a major source under Title I of the CAA in most cases is a source that emits, or has the potential to emit, 100 tons/year of any criteria air pollutant except for lead (Pb); the cutoff for a major source that emits lead is 5 tons/year. Volatile organic compounds (“VOCs,” an ozone precursor), nitrogen dioxide (NO₂), carbon monoxide (CO), and particulate matter (PM₁₀) have lower thresholds for major sources in serious, severe, and extreme nonattainment areas (see table below). Minor sources are sources that emit less than the emission rate that defines a major source.

Thresholds for Major Source Designation
(tpy = tons per year)

	VOC (ozone precursor)	CO	NO _x	PM ₁₀	SO ₂	Pb
General Cutoff	\$100 tpy	\$100 tpy	\$100 tpy	\$100 tpy	\$100 tpy	\$5 tpy
Serious Nonattainment Areas	\$ 50 tpy	\$ 50 tpy	\$ 50 tpy	\$ 70 tpy	n/a	n/a
Severe Nonattainment Areas	\$25 tpy	n/a	n/a	n/a	n/a	n/a
Extreme Nonattainment Areas	\$10 tpy	n/a	n/a	n/a	n/a	n/a

n/a = Not applicable; There are only serious nonattainment areas for ozone, CO, NO_x, and PM₁₀, and there are only severe and extreme nonattainment areas for ozone (VOCs are an ozone precursor).

2. **Area sources** are activities that cause emissions over a geographic area, such as vehicle traffic on unpaved roads, open burning, residential heating, and agricultural activities. Area sources are usually minor sources, but the combined emissions of a pollutant from one type of area source can be a large proportion of the total emissions of that pollutant in an area. Emissions from area sources are usually fugitive emissions.

3. **Mobile sources** include on-road and non-road sources. On-road mobile sources include vehicles designed for use on public roadways, such as cars, trucks, buses, and motorcycles. Non-road mobile sources are equipment or vehicles with internal combustion engines not generally for highway use. Examples of non-road mobile sources are lawn mowers, chain saws, airplanes, boats, and diesel locomotives.

4. **Biogenic sources** are non-manmade or natural emitters of air pollutants. For example, conifer trees emit terpenes which are volatile organic compounds, a precursor to ozone.

5. **Geogenic sources** are natural occurrences that create pollution, such as oil and natural gas seeps which emit ozone precursors (VOC and NO_x), volcanoes which emit PM and SO₂, and wind that blows dust from natural areas, creating particulate matter.

What types of emissions can be inventoried?

Whether a top-down or a bottom-up approach is used, you can compile inventories using actual emissions, allowable emissions, or emissions based on a facility's potential to emit, depending on the purpose of the inventory.

- » **Actual Emissions** record the actual rate of emissions of a pollutant from a source, calculated using actual operating hours, production rate, and where applicable, fuel combusted during the period of interest. For example, base-year inventories developed by states in support of SIPs are compiled using actual emissions. Actual emissions are used to validate atmospheric models.
- » **Allowable Emissions** are the product of an enforceable emissions rate (e.g., pounds of NO₂ per unit of product), the anticipated operating rate or activity level (e.g., units of product produced per hour), and the anticipated operating schedule (e.g., hours per day). In general, allowable emissions are used when emission projections are being developed for use in atmospheric modeling.
- » **Potential Emissions** are the capability of a source, at maximum design capacity, to emit a pollutant after the application of air pollution control equipment. Potential to emit estimates are based on the maximum capacity of a source after taking into consideration enforceable permit conditions such as the type of materials combusted, the type of materials processed, and the annual hours of operation. In general, potential emissions are estimated and reported in inventories in support of permitting activities under Title V of the CAA.

What data are necessary for an emissions inventory?

You will need information on the activities causing emissions, the frequency or rate of the activity, the locations of emissions points, the hours of operation (i.e., hours per day and days per year), and the temperature, height, and speed at which emissions enter the atmosphere. You will also need information on the level of emissions control (percent reduction) initially used, if any, and the level required by your attainment strategy.

What types of resources are available from EPA for emissions data, emissions factors, and emissions estimation methods?

Resources for Emissions Data, Emissions Factors, and Emissions Estimation Models:

- » ***Air CHIEF CD-ROM*** provides access to: air emissions data specific to estimating the types and quantities of pollutants that may be emitted for a wide variety of sources; AP-42 emission factors for stationary, area, and mobile sources; FIRE (emissions estimation database, see description below); Standard Classification Codes (SCC); area and mobile source codes (AMS); 1997 North American Industrial Classification System (NAICS) matched to the 1987 Standard Industrial Codes (SIC); the *Handbook for Criteria Pollutant Inventory Development*; the National Emissions Inventory (NEI) database (see description below); and several types of emissions estimation models. More information about this CD-ROM is available at the Clearinghouse for Inventories and Emissions Factors (CHIEF) website (www.epa.gov/ttn/chief/airchief.html#order). It can be ordered at that website or through the Government Printing Office ((202) 512-1800).

Resources for Emissions Data:

- » ***The National Emission Inventory (NEI)*** is a national repository database that blends state, local and tribal supplied data with EPA derived data to form a comprehensive national inventory of criteria and toxic pollutants. The NEI is accessible at www.epa.gov/ttn/chief/net/index.html#dwld, and from the AIRData web site at www.epa.gov/air/data/net.html.

Resources for Emission Factors:

- » ***Compilation of Air Pollutant Emission Factors (AP-42)*** contains criteria pollutant emission estimation factors for point and area sources. It is available at www.epa.gov/ttn/chief/ap42.html and the AirCHIEF CD-ROM (described above).
- » ***Factor Information Retrieval (FIRE) Data System*** is a database of EPA's recommended emission estimation factors for criteria and hazardous pollutants (including emission factors from AP-42). FIRE can be accessed at

www.epa.gov/ttn/chief/fire.html and on the Air CHIEF CD-ROM (described above).

Resources on Emission Estimation Models (can be downloaded free-of-charge):

- » ***Landfill Gas Emissions Model*** (www.epa.gov/ttn/catc/products.html#software).
- » ***TANKS*** to estimate emissions from fixed- and floating-roof storage tanks (www.epa.gov/ttn/chief/tanks.html).
- » ***WATER8*** and ***CHEMDAT8*** to estimate air emissions from wastewater collection and treatment systems (www.epa.gov/ttn/chief/software.html#water8).
- » ***MECH*** for estimating particulate emissions from paved roads, unpaved roads, materials handling, agricultural tilling, and construction and demolition, and **PM** for estimating PM_{2.5} emissions (www.epa.gov/ttn/chief/software.html#fugitive).

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Appendix G

Air Quality Monitoring

This appendix provides additional information on air quality monitoring including:

- » The principle objectives of air quality monitoring
- » The types of pollutants that are monitored
- » The types of monitors that are available
- » The types of monitoring networks
- » EPA resources for monitoring network design, installing and operating monitors, and reporting air quality monitoring data

What are the principle objectives of air quality monitoring?

One way to protect and assess air quality is through the development of an Ambient Air Monitoring Program. Air quality samples are generally collected for one or more of the following purposes:

- » To judge compliance with and/or progress made towards meeting ambient air quality standards.
- » To activate emergency control procedures that prevent or alleviate air pollution episodes.
- » To observe pollution trends throughout the region, including non-urban areas.
- » To provide a data base for research evaluation of effects: urban, land-use, and transportation planning; development and evaluation of abatement strategies; and development and validation of diffusion models.

What types of pollutants are monitored?

Currently the air quality monitoring networks in the United States focus on the criteria pollutants, as well as the relevant ambient air pollution information for visibility impairment and acid rain. Although there is currently no national air toxics monitoring network, there are approximately 300 monitoring sites currently producing ambient data on some of the 188 hazardous air pollutants (HAPs) listed in the 1990 Clean Air Act amendments. EPA is working together with tribal, state and local air monitoring agencies to build upon the existing monitoring sites to develop a national air toxic monitoring network. It should be noted that many of the programs designed to reduce ambient concentration of the criteria pollutants also aid in reducing pollution that contributes to air toxics pollution, visibility impairment and acid rain. In terms of the six criteria pollutants, particulates and ozone are the pollutants most often monitored.

Criteria Pollutants

In some cases, proxy pollutants may be measured to better understand the criteria pollutant of interest. For instance, ozone concentrations may be monitored by measuring the actual level of ozone in a neighborhood, urban area or region or by monitoring for ozone precursors, NO_x and VOC. To monitor for $\text{PM}_{2.5}$, PM_{10} and PM_{TSP} (total suspended particulates), organic and elemental carbon, sulfur dioxide and sulfate, particle nitrate, ammonia or nitric acid may be measured. Lead may be monitored by measuring for PM and then determining the fraction that contains the pollutant (40CFR Part 50, Appendix G).

Acidic Deposition

Measurements of sulfate, nitrate, hydrogen ion, ammonia, chloride and base cations (calcium, magnesium and potassium) are taken to assess atmospheric deposition and determine the contribution of SO_2 and NO_2 to acid rain.

Visibility-Related Pollutants

Visibility-related characteristics and measurements can be partitioned into three groups:

Aerosol - The physical properties of the ambient atmospheric particles (chemical composition, size, shape, concentration, temporal and spatial distribution and other physical properties) through which a scene is viewed.

Optical - The ability of the atmosphere to scatter or absorb light passing through it. The physical properties of the atmosphere are described by extinction, scattering and absorption coefficients plus an angular dependence of the scattering known as the normalized phase function. Optical characteristics integrate the effects of atmospheric aerosols and gasses.

Scene - The appearance of a scene viewed through the atmosphere. Scene characteristics are more nearly in line with the simple definition of visibility than aerosol or optical characteristics. Scene characteristics include observer visual range, scene contrast, color, texture, clarity, and other descriptive terms. Scene characteristics change with illumination and atmospheric composition.

Aerosol and optical characteristics depend only on the properties of the atmosphere through which light passes. Scene characteristics, however, are also dependent on the scene and lighting conditions.

"Visual air quality" describes the air pollution aspects of visibility. Visual air quality is what must be monitored and preserved in class I areas, not the overall visibility which is influenced by nonpollution factors (i.e., clouds, snow cover, sun angle, etc.).

The distribution and extent of pollutants in the atmosphere relative to the observer's sight path has a large effect on the appearance of visibility impairment. If the pollutants are uniformly distributed from the ground to a height well above the highest terrain, it is known as a "uniform haze." If the top edge of the pollution layer is visible, as is often the case when pollution is trapped below an inversion, then it is called a "surface layer." A pollution distribution that is not in contact with the ground is an "elevated layer." "Plumes" can be thought of as a special case of an elevated layer, though from many vantage points it may not be possible to distinguish a plume from an elevated layer. It is possible to have combinations of pollutant distributions such as multiple elevated layers superimposed upon a uniform haze.

Uniform haze and surface layered haze can be monitored from the ground by a variety of methods. Elevated layers must be either remotely monitored from the ground or from instruments carried aloft.

What types of monitors are available?

Sampling equipment requirements are generally divided into three categories, consistent with the desired averaging times:

- A. **Continuous** - Pollutant concentrations determined with automated methods, and recorded or displayed continuously.
- B. **Integrated** - Pollutant concentrations determined with manual or automated methods from integrated hourly or daily samples on a fixed schedule.
- C. **Static** - Pollutant estimates or effects determined from long-term (weekly or monthly) exposure to qualitative measurement devices or materials.

Air monitoring sites that use automated equipment to continually sample and analyze pollutant levels may be classified as primary. Primary monitoring stations are generally located in areas where pollutant concentrations are expected to be among the highest and in areas with the highest population densities; thus, they are often used in health effects research networks. These stations are also designed as part of the air pollution episode warning system.

Particulate Monitoring

Particulate monitoring is usually accomplished with manual measurements and subsequent laboratory analysis. In this method, a filter-based high-volume sampler - a vacuum-type device that draws air through a filter or absorbing substrate - retains atmospheric pollutants for future laboratory weighing and chemical analysis. This type of sampler provides average concentrations over a period of up to 24 hours. The total air flow is determined by the difference in rotameter readings at the start and conclusion of the test.

Continuous monitoring methods for suspended particles are also available. Continuous measurement methods include Mass and Mass Equivalent (Tapered Element Oscillating Microbalance (TEOM), Piezoelectric Microbalance, Beta Attenuation Monitor (BAM) and

Pressure Drop Tape Sampler (CAMMS)), Visible Light Scattering (Nephelometer, Optical Particle Counter (OPC), Condensation Nuclei Counter (CNC), Aerodynamic Particle Sizer (APS) and Light Detection And Ranging (LIDAR)), Visible Light Absorption (Aethalometer and Particle Soot/Absorption Photometer and Photoacoustic Spectroscopy), Electrical Mobility (Electrical Aerosol Analyzer (EAA) and Differential Mobility Particle Sizer (DMPS)), Chemical Components (Single Particle Mass Spectrometers, Carbon Analyzer, Sulfur Analyzer, Nitrate Analyzer and Multi-Elemental Analyzer) and Precursor Gases (Ammonia Analyzer, Nitric Acid Analyzer, Fourier Transform Infrared (FTIR) Spectroscopy and Other Nitric Acid Instruments). Three continuous PM₁₀ monitors based on inertial mass and electron absorption have been designated as equivalent methods that can be used to determine compliance with the PM₁₀ NAAQS.

Federal Reference Method (FRM) or Federal Equivalent Method (FEM) samplers are to be used in PM_{2.5} compliance monitoring networks (i.e., State and Local Air Monitoring Stations (SLAMS) and National Ambient Monitoring Stations (NAMS)). Interagency Monitoring of Protected Visual Environments (IMPROVE) samplers may also be used at regional background or regional transport sites in lieu of FRMs or FEMs. Continuous monitors can be tested and classified as Class III FEM for compliance monitoring.

Gaseous Pollutant Monitoring

Monitoring for gaseous pollutants, such as sulfur dioxide, is accomplished with dynamic samplers for average concentrations over a 24-hour period and with static samplers for longer periods, e.g., 30 days.

Visibility Monitoring

As indicated above, visibility-related characteristics and measurements can be partitioned into three groups: aerosol, optical and scene. Thus, visibility monitors are categorized in a similar way. Aerosol monitors are used to obtain concentration measurements of atmospheric constituents. Optical monitors are used to measure the light scattering and absorption properties of the atmosphere, independent of physical scene characteristics or illumination conditions. Scene monitors use still and/or time-lapse photography (including digital imagery) to provide a qualitative representation of the visual air quality in the area of interest.

The Interagency Monitoring of Protected Visual Environments (IMPROVE) monitoring protocol defines that, where possible, aerosol, optical, and scene monitoring shall be conducted at each site. Site logistics do restrict the operation of certain instruments at some sites. The instrumentation used to fulfill IMPROVE protocols include: "Aerosol" IMPROVE Modular Aerosol Sampler; "Optical" Transmissometer or Nephelometer (collocated with an air temperature/relative humidity sensor); and "Scene" Automatic Camera Systems.

Meteorological Data

Atmospheric considerations may include spatial and temporal variabilities of the pollutants and their transport. Effects of buildings, terrain, and heat sources or sinks on the air trajectories can produce local anomalies of excessive pollutant concentrations. Meteorology must be considered in determining not only the geographical location of a monitoring site but also such factors as height, direction, and extension of sampling probes. Wind speed, direction and variability can greatly influence the dispersal of pollutants.

Wind speed affects the travel time from the pollutant source to the receptor and the dilution of polluted air in the downwind direction. The concentration of air pollutants are inversely proportional to the wind speed.

Wind direction influences the general movements of pollutants in the atmosphere. Review of available data can indicate mean wind direction in the vicinity of the major sources of emissions.

Wind variability refers to the random motions in both horizontal and vertical velocity components of the wind. These random motions can be considered atmospheric turbulence, which is either mechanical (caused by structures and changes in terrain) or thermal (caused by heating and cooling of land masses or bodies of water). If the scale of turbulent motion is larger than the size of the pollutants plume, the turbulence will move the entire plume and cause looping and fanning; if smaller, it will cause the plume to diffuse and spread out.

Most ambient air monitoring programs include meteorological monitoring in order to obtain more information on pollutant trends. For instance, the Clean Air Status and Trends Network (CASTNet) records hourly meteorological parameters such as temperature, relative humidity, solar radiation, ozone, precipitation and wind speed/direction. The National Atmospheric Deposition Program (NADP) and IMPROVE programs monitor daily precipitation and relative humidity/temperature respectively. In some cases, temperature sensing at multiple elevations is used to monitor stability of the air mass.

What types of monitoring networks are available?

Monitoring networks are designed to meet their network objective (including both the appropriate spatial scale and pollutant(s)). Spatial scales range from micro to global. Pollutants can include the criteria pollutants, visibility impairing pollutants, acid deposition, and others. In addition to monitoring network objectives and spatial scale, three types of monitoring network are discussed in this section: the ambient monitoring network which measures the criteria pollutants, the IMPROVE network which characterizes visibility impairment, and two acidic deposition networks.

A monitoring network should be designed to meet one of six basic objectives listed below:

- A. to determine highest concentrations expected to occur in the area covered by the network;
- B. to determine representative concentrations in areas of high population density;
- C. to determine the impact on ambient pollution levels of significant sources or source categories;
- D. to determine general background concentration levels;
- E. to determine the extent of regional pollutant transport among populated areas, and in support of secondary standards; and
- F. to determine welfare-related impacts in more rural and remote areas.

These six objectives indicate the nature of the samples that the monitoring network will collect which must be representative of the spatial area being studied.

Spatial Scales

The goal in siting stations is to correctly match the spatial scale represented by the sample of monitored air with the spatial scale most appropriate for the monitoring objective of the station. The representative measurement scales of greatest interest are shown below:

Micro	Concentrations in air volumes associated with area dimensions ranging from several meters up to about 100 meters
Middle	Concentrations typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometer
Neighborhood	Concentrations within some extended area of the city that has relatively uniform land use with dimensions in the 0.5 to 4.0 kilometers range
Urban	Overall, citywide conditions with dimensions on the order of 4 to 50 kilometers. This scale would usually require more than one site for definition
Regional	Usually a rural area of reasonably homogeneous geography and extends from tens of hundreds of kilometers
National/Global	Concentrations characterizing the nation and the globe as a whole

The following table illustrates the relationships among the six basic monitoring objectives and the scales of representativeness that are generally most appropriate for that objective.

Monitoring Objective	Appropriate Siting Scale
Highest Concentration	Micro, middle, neighborhood, sometimes urban
Population	Neighborhood, urban
Source Impact	Micro, middle, neighborhood
General/background	Neighborhood, regional
Regional Transport	Urban/regional
Welfare-related	Urban/regional

Ambient Air Quality Monitoring Program

The EPA's ambient air quality monitoring program is carried out by State, tribal, and local agencies and consists of three major categories of monitoring stations, State and Local Air Monitoring Stations (SLAMS), National Air Monitoring Stations (NAMS), and Special Purpose Monitoring Stations (SPMS). Additionally, a fourth category of a monitoring station, the Photochemical Assessment Monitoring Stations (PAMS), which measures ozone precursors (approximately 60 volatile hydrocarbons and carbonyl) has been required by the 1990 Amendments to the Clean Air Act. Sensitive equipment measures the concentration of many different air pollutants to determine the ambient concentrations of the criteria pollutants. Some types of equipment run continuously, measuring pollutant concentrations every few minutes, and calculating an average concentration for each hour of the day and night. Other types of equipment operate intermittently, perhaps every other day or every sixth day. The equipment runs for a specified time period, often 24 hours, and subsequent laboratory analysis determines the average pollutant concentration during the measurement time.

State and Local Air Monitoring Stations (SLAMS)

The SLAMS consist of a network of ~ 4,000 monitoring stations whose size and distribution is largely determined by the needs of State and local air pollution control agencies to meet their respective State implementation plan (SIP) requirements.

National Air Monitoring Stations (NAMS)

The NAMS (1,080 stations) are a subset of the SLAMS network with emphasis being given to urban and multi-source areas. In effect, they are key sites under SLAMS, with emphasis on areas of maximum concentrations and high population density.

Special Purpose Monitoring Stations (SPMS)

Special Purpose Monitoring Stations provide for special studies needed by the State and local agencies to support State implementation plans and other air program activities. The SPMS are not permanently established and, can be adjusted easily to accommodate changing needs and priorities. The SPMS are used to supplement the fixed monitoring network as circumstances

require and resources permit. If the data from SPMS are used for SIP purposes, they must meet all QA and methodology requirements for SLAMS monitoring.

Photochemical Assessment Monitoring Stations (PAMS)

A PAMS network is required in each ozone nonattainment area that is designated serious, severe, or extreme. The required networks will have from two to five sites, depending on the population of the area. There will be a phase-in period of one site per year starting in 1994. The ultimate PAMS network could exceed 90 sites at the end of the 5-year phase-in period.

The individual measurements -- 1-hour and 24-hour average air pollutant concentrations -- are submitted to EPA and stored in the Aerometric Information Retrieval System (AIRS) database. They are called AIRS raw data. In addition, AIRS software creates and stores an annual summary of the air pollution measurements from each unit of monitoring equipment. The annual summary includes information such as the highest values reported, the average value, and the number of values above the NAAQS (health-based threshold levels).

Interagency Monitoring of Protected Visual Environments (IMPROVE)

The National Visibility Program established in 1980 requires the protection of visibility in 156 mandatory federal Class I areas across the county. In 1987, the IMPROVE visibility network was established as a cooperative effort between EPA, the National Oceanic and Atmospheric Administration, the National Park Service, the U.S. Forest Service, the Bureau of Land Management, the U.S. Fish & Wildlife Service, and state governments. The objectives of the network are to establish current conditions, to track progress toward the national visibility goal, by documenting long-term trends, and to provide information for determining the types of pollutants and sources primarily responsible for visibility impairment. Chemical analysis of aerosol measurements provides ambient concentrations and associated light extinction for PM₁₀, PM_{2.5}, sulfates, nitrates, organic and elemental carbon, crustal material, and a number of other elements. The IMPROVE program has established protocols for aerosol, optical, and photographic monitoring methods, and these methods are employed at more than 100 sites, most of which are Class 1 areas. In the calendar year 2000, an additional 80 monitoring sites using the IMPROVE aerosol monitoring protocol were scheduled for placement.

Acidic Deposition Monitoring Networks

Total atmospheric deposition is determined using both wet and dry deposition measurements. Wet deposition is the portion dissolved in cloud droplets and is deposited during rain or other forms of precipitation. Dry deposition is the portion deposited on dry surfaces during periods of no precipitation as particles or in a gaseous form. Although the term "acid rain" is widely recognized, the dry deposition portion can range from 20-60 percent of total deposition. The NADP and CASTNet were developed to monitor wet and dry deposition, respectively.

The National Atmospheric Deposition Program/National Trends Network (NADP/NTN)

NADP/NTN is a nationwide network of precipitation monitoring sites. The network is a cooperative effort between many different groups, including the State Agricultural Experiment Stations, U.S. Geological Survey, U.S. Department of Agriculture, and numerous other governmental and private entities. The NADP/NTN has grown from 22 stations at the end of 1978, our first year, to over 200 sites spanning the continental United States, Alaska, and Puerto Rico, and the Virgin Islands. The purpose of the network is to collect data on the chemistry of precipitation for monitoring of geographical and temporal long-term trends. The precipitation at each station is collected weekly according to strict clean-handling procedures. It is then sent to the Central Analytical Laboratory where it is analyzed for hydrogen (acidity as pH), sulfate, nitrate, ammonium, chloride, and base cations (such as calcium, magnesium, potassium and sodium). The NADP has also expanded its sampling to two additional networks. The Mercury Deposition Network (MDN), currently with over 35 sites, was formed in 1995 to collect weekly samples of precipitation which are analyzed by Frontier Geosciences for total mercury. The objective of the MDN is to monitor the amount of mercury in precipitation on a regional basis; information crucial for researchers to understand what is happening to the nation's lakes and streams. Another network, the Atmospheric Integrated Research Monitoring Network (AIRMoN), is operated by the National Oceanic and Atmospheric Administration (NOAA) and was formed for the purpose of studying precipitation chemistry trends with greater temporal resolution. Precipitation samples are collected daily from a network of nine sites and analyzed for the same constituents as the NADP/NTN samples.

Clean Air Status and Trends Network (CASTNET)

The CASTNet was primarily designed to measure dry acid deposition. Some monitors also record rural ozone data as well as the chemical constituents of $PM_{2.5}$. Established in 1987, CASTNET now comprises 79 monitoring stations across the U.S., 74 measuring dry deposition, 19 measuring wet-deposition, 68 measuring O_3 and eight measuring aerosols for visibility assessment. The longest data records are primarily at eastern sites.

CASTNET is considered the nation's primary source for atmospheric data to estimate dry acidic deposition and to provide data on rural ozone levels. Each dry-deposition station measures weekly average atmospheric concentrations of sulfate (SO_4), nitrate (NO_3), ammonium (NH_4), sulfur dioxide (SO_2), and nitric acid, hourly concentrations of ambient ozone levels and meteorological conditions required for calculating dry deposition rates. Dry deposition rates are calculated using atmospheric concentrations, meteorological data, and information on land use, vegetation, and surface conditions.

The CASTNET provides atmospheric data on the dry deposition component of total acid deposition, ground-level ozone and other forms of atmospheric pollution. Used in conjunction with other national monitoring networks, CASTNET is used to determine the effectiveness of national emission control programs. The majority of the monitoring stations are operated by

EPA's Office of Air and Radiation; however, approximately 20 stations are operated by the National Park Service in cooperation with EPA.

CASTNET complements the database compiled by NADP. Because of the interdependence of wet and dry deposition, NADP wet deposition data are collected at or near all CASTNET sites. Together, these two long-term databases provide the necessary data to estimate trends and spatial patterns in total atmospheric deposition.

Ozone data collected by CASTNET are complementary to the larger ozone data sets gathered by the State and Local Air Monitoring Stations (SLAMS) and National Air Monitoring Stations (NAMS) networks. Most air quality samples at SLAMS/NAMS sites are located in urban areas, while CASTNET sites are in rural locations. Hourly ozone measurements are taken at each of the 50 sites operated by EPA. Data from these sites provide information to help characterize ozone transport issues and ozone exposure levels.

What types of resources are available from EPA for monitoring network design, installing and operating monitors, and reporting air quality monitoring data?

Resources for Guidance, Measurement Equipment, and Network Design:

- » ***Ambient Monitoring Technology Information Center*** (www.epa.gov/ttn/amtic/) (AMTIC) is centered around the exchange of ambient monitoring related information. Established in 1991 as an electronic Bulletin Board System (BBS), AMTIC has evolved with changing technology into a page on the World Wide Web (WWW). AMTIC is operated by EPA's Office of Air Quality Planning and Standards (OAQPS) through the Monitoring and Quality Assurance Group (MQAG). AMTIC contains information on all the Reference and Equivalent methods for the Criteria pollutants, the TO Methods and other noncriteria pollutant methodologies, Federal Regulations pertaining to ambient monitoring, ambient monitoring QA/QC related information, information on ambient monitoring related publications, ambient monitoring news (including the AMTIC Newsletter), field and laboratory studies of interest, and updates on any new or developing EPA Ambient Air standards.
- » ***The Interagency Monitoring of Protected Visual Environments (IMPROVE)*** (<http://vista.cira.colostate.edu/improve/Data/GraphicViewer>) website provides links to Monitoring Protocol and Information documents such as Quarterly Newsletters and Standard Operating Procedures as well as Regional Haze Guidance Documents. Information is also available on IMPROVE data gathering methods and measurement equipment Modules A, B, C and D. This site also provides an extensive list of publications, resources and links to Data Analysis (including analysis tools and algorithms), Gray Literature (unpublished analyses), Visibility and Aerosols Science and Policy documents. Monitoring Studies focusing on Class I and Urban areas are also available.

- » ***Tribal Air Monitoring Support Center (TAMS)*** (www4.nau.edu/itep/intro.html) was created through a partnership with ITEP and the United States Environmental Protection Agency. Located at the Radiation and Indoor Environments National Laboratory in Las Vegas, Nevada, the TAMS Center will provide instrument training and filter weighing services to all interested tribes.

Resources for Air Quality Data:

- » ***The Aerometric Information Retrieval System (AIRS)*** is EPA's repository of criteria air pollutant monitoring data since the 1970's. Considerably less data for hazardous air pollutants have been collected, mostly after 1995. The Monitors segment of AIRData deals with ambient air quality -- the prevailing levels of air pollution in cities and towns across the United States. Information presented in the Monitors segment of AIRData comes from the Air Quality Subsystem (AQS) of the AIRS database (www.epa.gov/ttn/airs/aqs/index.html). EPA updates the AIRS database every week. Most states submit their air monitoring data monthly, with different groups of states submitting data during any given week. After the individual measurements of hourly or daily pollutant concentrations have been stored in the AIRS database, calendar-year summary values are computed for each air monitor. Only these summary values are extracted from the AIRS database and presented in AIRData reports and queries. The individual hourly and daily monitoring values are not available at this AIRData website. To receive information directly from AIRS, you need to register for an account on the EPA mainframe computer. For information about obtaining an account, call 1-(800)-334-2405, (919)-514-5232, or call the National Technical Information Service at (703) 605-6000.

AIRData provides two ways to access Monitor data: AIRData Monitor Reports and AIRData Monitor Queries. AIRData Monitor Reports present annual summary data for criteria pollutants, and descriptive information about the monitoring sites for those pollutants. This option is preferred for a quick review of the most significant measures of air quality. The Reports database is updated monthly. AIRData Monitor Queries present annual summary data for all pollutants in the AIRS/AQS database. Queries include many more pollutants and data elements than Reports, and they display values in a more technical format. Queries are intended primarily for environmental professionals, but the information is available to all, of course. The interim database used for Queries is updated two to four times per year.

- » ***The Interagency Monitoring of Protected Visual Environments (IMPROVE)*** <http://vista.cira.colostate.edu/improve/Data/GraphicViewer/> website also offers Data Resources, Graphical Displays and Publications. Data Resources include metadata, (state by state information on all IMPROVE monitors, including latitude, longitude, elevation, sampling equipment, documented equipment/monitoring changes, data collection start and end dates and sponsor), raw data and data products such as Annual, Seasonal and Monthly Fine Mass Composition and Light Extinction Budgets,

aggregated over the period of March 1996 to February 1999 according to Class I Area. Light Extinction Diurnal Cycles, Annual Fine Mass/Light Extinction Group 10, 50, 90 Trends, raw Aerosol and Optical data, photographs and Monthly Regional Haze and RH Correction Factors are also available.

The IMPROVE Graphic Viewer allows browsing of interactive Spatial, Temporal, Variable and Frequency displays using the information from the Data Resources section. It also includes a report on Long-Term Trends of Fine Mass and its Major Aerosol Types for 1988-1998.

- » ***The Clean Air Status and Trends Network (CASTNET)*** (<http://www.epa.gov/castnet/>) provides atmospheric data on acid rain (specifically dry acid deposition), tropospheric (ground-level) ozone and other forms of atmospheric pollution. A Sampling Matrix, including state and site specific information, provides details of each CASTNET sampling station. CASTNET Annual Reports (1998 and 1999) may be accessed from this site as well as Data Reports, Charts and Graphs of hourly, diurnal, geographic and annual assessments of dry acid deposition, ozone and meteorological parameters.

- » ***The National Atmospheric Deposition Program/National Trends Network (NADP/NTN)*** (<http://nadp.sws.uiuc.edu/>) is the longest running national deposition monitoring network. Many data products are accessible from this website, including weekly and daily precipitation chemistry data, monthly, seasonal, and annual precipitation-weighted mean concentrations, annual and seasonal deposition totals, mercury deposition data, daily precipitation totals, color isopleth maps of precipitation concentrations and wet deposition, site photos, maps, and information and quality assurance data and information. In addition, publications such as brochures, manuals, committee meeting proceedings, annual program reports, annual summaries (1997-2000) and quality assurance reports (1996-1999) are available.

Appendix H

TIP Enforceability Checklist¹

This checklist provides general enforceability guidance applicable to all possible components of a TIP. However, TIPs do not need to contain all of these components. You need only to refer to those sections that apply to the provisions included in your tribe's TIP.

Enforceability Analysis	EPA Requirement
Applicability	
What sources are being regulated?	Clearly stated in the rule.
What are the criteria for exemptions?	Clearly stated in the rule.
Is the calculation procedure for exemptions clearly identified?	You must include an example calculation or clear explanation of how to determine exemption.
Where Is the emission inventory of affected sources listed in the document?	Allowable and actual emissions in the source category should be included in your TIP, for enforcement purposes and determination of any baselines in the regulation(s).
Is the averaging time(s) used in the rule different from that of the ambient standards?	The averaging and ambient standard times must be consistent . The averaging time is typically equal to or shorter than the ambient standard time. Longer term averaging is available only in limited instances, provided the ambient standard is not compromised.
What are the units of compliance (pounds VOC per gallon of solids applied less water, grains per dry standard cubic foot, etc)?	Clearly stated in the rule.

¹ This appendix is adapted from *Regulatory Development Enforceability on Regulations* by Susan E. Bromm, US EPA., no date.

Enforceability Analysis	EPA Requirement
Are there mechanisms for limiting multiple sources at one facility? Are they enforceable?	Explicit description of how overall total facility emissions are to be determined. VOC equivalency must be on a “solids applied” basis. Any method must be independently reproducible. Provision must be explicit as to whether case-by-case approval is required. If provision is intended to be generic, then bubble policy must be met.
If there is a redesignation will this change your emission limits? If yes, which ones and how?	Upon the redesignation of your area to attainment, the Regulation may not allow for self nullification. Maintenance demonstration required in order to drop regulation.
Compliance Dates	
What is your compliance date? What is the area’s attainment date?	Your compliance date Must not be later than approved (or soon to be approved) date of attainment unless emission reductions are not necessary for attainment. In some cases, it will be necessary for the regulation to specify dates in compliance schedules.
Specificity of Conduct	
What test method is required?	Your Test method must be explicitly stated.
What is the averaging time in the compliance test method?	The Averaging time and application of your emission limit must be explicitly stated.
Is a compliance calculation or evaluation required?	Your formula, period of compliance, and/or evaluation method must be explicitly stated.
Incorporation by Reference	
What is your tribe’s authority for rulemaking?	Demonstrate the legal mechanism to promulgate and enforce rules.
Are the methods/rules incorporated by reference in the right manner?	Clearly stated in the rule.

Enforceability Analysis	EPA Requirement
Recordkeeping	
What records are required to determine compliance?	Clearly stated in the rule.
In what form or units (lbs/gal, gr/dscf, etc.) must the records be kept? On what time basis?	Records to be kept must be consistent with units of compliance in the performance requirements, including the applicable time period.
Does the rule explicitly require the records to be kept?	There must be a clear, separately enforceable provision that requires records to be kept.
Exemptions	
What are the allowed exemptions?	All exemptions Must be clearly defined and distinguishable from what constitutes a violation.
Is the criteria for application clear?	Same as above.
Include malfunction provisions.	Rule must specify what exceedances may be excused, how the standard is to be applied, and who makes the determination.

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Appendix I

Procedures for Area Redesignation to Class I

The procedures outlined in this appendix are for tribal governments seeking to have areas within their jurisdiction that are in attainment of NAAQS redesignated as a Class I attainment area. Tribes may also seek redesignation for areas other than their reservations. These procedures are based on requirements set forth in section 164 of the Clean Air Act, 40 CFR 51.166(g) and 40 CFR 52.21(g), and the Tribal Authority Rule, 63 Federal Register 7254 which is codified at 40 CFR 49.

The lands within the exterior boundaries of an Indian reservation may be redesignated only by the appropriate tribal government. Before proposing a redesignation, the tribe needs to prepare a discussion of the reasons for the proposed redesignation, including a satisfactory description and analysis of the health, environmental, economic, social, and energy effects of the proposal.

The tribe is required to hold public hearings on the proposed redesignation in the areas proposed to be redesignated and in areas that may be affected by the proposed redesignation. At least 30 days before the hearing, your tribe needs to issue a public notice of the hearing that includes:

- » A prominent advertisement in the area affected announcing the date, time, and place of the hearing
- » Information about the availability of the proposal and discussion document in at least one location in the area

The tribal government needs to submit a proposal to redesignate to the EPA Administrator through the appropriate EPA regional office. The tribe also needs to prepare and retain, for inspection by the EPA Administrator upon request, a record of the hearing that includes a list of witnesses together with the text of each presentation. Along with the proposal to redesignate, the tribe must submit to EPA a certification that the hearing was held in accordance with the requirements of 40 CFR 51.102. If federal lands are included in the proposed redesignation, the appropriate Federal Land Manager needs written notice and an opportunity to confer with the tribe regarding the redesignation.

The EPA Administrator will approve or disapprove the proposed redesignation within 90 days of submission. The proposal will be disapproved after notice and opportunity for public hearing only if it is found that it did not meet the procedural requirements in the EPA regulations or it was inconsistent with the Clean Air Act's restrictions on area classifications. If the EPA Administrator disapproves a proposed redesignation, it may be resubmitted after correcting the deficiencies noted by the Administrator.

References:

Section 164 of the CAA; 40 CFR 51.166(g); and 40 CFR 52.21(g).

Appendix J

Regulation Development¹

This is a check list of questions to help a tribe in developing an effective rule.

General Considerations

- » What is the problem that needs to be resolved by the rule?
- » Are the purpose, intent, and requirements as clear as possible in the actual provisions of the regulation?
- » Is the affected regulated community familiar with the program?
- » If the rule will bring a significant number of new facilities into the regulated universe, how will they find out that they are subject to the regulation?

Clarity

Clarity promotes compliance. Regulatory language that is clear and concise will help the regulated community understand its obligations under the regulation.

- » Does the rule contain complex language that could be interpreted in more than one way by parties acting in good faith?
- » Are ambiguous terms defined or clarified?
- » Does the rule contain inconsistencies or contradictions?
- » Is the date the rule goes into effect stated?
- » Are all events or activities that must occur prior to the effective date identified?
- » Have clarifying tools such as definitions, tables, or flowcharts been used as appropriate?

Specificity

If regulatory requirements, standards of performance, or decision-making criteria are left open to interpretation, regulated entities and enforcement personnel may be inconsistent in their implementation and application of the requirements.

- » Has non-specific language that may require clarification through guidance or policy been avoided?
- » Are performance standards defined in clear and measurable terms?
- » Has the latitude of an inspector's discretion in applying professional judgement been specified, if applicable?
- » Has the regulated community been identified and defined?
- » Have the exclusions from the regulation been clearly identified?

Enforcement Practicability

- » How will compliance or non-compliance be verified by inspectors or enforcement personnel?
- » What is the potential increase in the size of the regulated universe based on the rule?
- » What are the associated implementation and enforcement implications?
- » What professional qualifications will be needed to conduct inspections and evaluate compliance with the rule?
- » How will compliance with the regulation be monitored (field inspections, records review, facility reports, self-enforcing)?
- » Has self-reporting/self-monitoring by the regulated entity been used to the maximum extent possible?
- » Have EPA-approved or standardized test methods been incorporated to ensure data uniformity and comparability?
- » Have analytical methods that can be applied in the field or laboratory been incorporated to the extent feasible?
- » If a rule is self-implementing, is it practical to incorporate the requirements into the permit process?
- » Does adequate authority exist for entering, inspecting, and sampling at regulated facilities?

Burden of Proof

- » Is it clearly stated whether the burden of proof lies with the tribal authority or with the owner/operator?
- » Is adequate proof defined?

Notification, Recordkeeping, and Reporting

- » Is information that must be recorded and maintained specified?
- » Is the period of time for which information must be retained stated?
- » Does all information that will be submitted to tribal authorities serve a specific purpose?
- » Is notification required?
- » What information should be included in notification?
- » Do reporting requirements facilitate review for non-compliance?

Other Programs

- » Have you considered the rule's impact on other tribal environmental programs and offices?
- » Could compliance with the rule result in potential cross-media contaminant transfer?

- » Have other program offices been consulted regarding cross-program compliance issues?

Enforcement Mechanisms

There are numerous mechanisms that can be employed to evaluate and monitor compliance with regulations. Think about appropriate tools for compliance monitoring and enforcement as the regulation is being developed.

- » Has independent confirmation of compliance (e.g., by professional engineer) been considered as a means to add credibility to assessment of technical requirements?
- » Have self-certification measures such as verifying data accuracy with EPA-approved methods, training by certified hazardous materials trainers, or other certifications been considered?

Endnote

- 1 This appendix is adapted from *Regulatory Development Enforceability of Regulations* by Susan E. Bromm, US EPA., no date.

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TIP Completeness Checklist

This TIP completeness checklist is an example used in Region V.

EPA REGION V COMPLETENESS REVIEW

A. Regulatory (Administrative Materials)

1. Is the submittal accompanied by a formal letter of submittal from the governor's designee? yes___ no___

The date of submittal is _____

2. Did the State provide evidence that it has incorporated the revision in the Wisconsin Administrative Code? yes___ no___

The month of publication in was _____

The effective date is _____

Are test methods/rules incorporated by reference correctly?

Has approval been obtained from the state Attorney General?
yes___ no___not applicable___

3. Did the State provide evidence that it has the necessary legal authority under State law to adopt and implement the revision? yes___ no___ rule analysis which cites authorizing statutes submitted? yes___ no___
4. Does the submittal include a copy of the actual regulation or document submitted for review? yes___ no___
5. Did the State provide evidence that it followed all of the requirements of its Administrative Procedures Act in conducting and completing adoption/issuance of the revision? yes___ no___
6. Did the State provide evidence that Public Notice was given of the revision, including the date of publication? yes___ no___
7. Did the State provide certification that public hearings were held in accordance with the information provided in the public notice (notarized SIP Revision Certification)?
yes___ no___

8. Does the submittal contain a compilation of public comments and the State's response? yes___ no___

B. Technical Support

1. Does the submittal identify all regulated pollutants affected by the revision?
yes___ no___

2. Does the submittal identify the designation, status of the attainment plan and attainment date for the area(s)? yes___ no___

3. Does the submittal identify the location and types of affected sources?
yes___ no___

4. Does the submittal quantify the changes in SIP-allowable emissions and estimate or quantify the changes in actual emissions from affected sources?
yes___ no___

5. Has the State demonstrated that the NAAQS/PSD increment/RFP demonstration/visibility will be protected if the revision is approved and implemented? yes___ no___

5a. For any request to redesignate an area to attainment, has the State submitted a revision which provides for maintenance of the primary NAAQS fir at least 10 years? yes___ no___ not applicable___

6. Has the State provided modeling information (if necessary) to support the revision?
yes___ no___ unnecessary___

7. Has the State provided evidence that emission limitations are based on continuous emission reduction technology? yes___ no___ NA___

8. Has the State provided evidence that the revision contains emission limitations, work practice standards and recordkeeping/reporting requirements, where necessary, to ensure emission levels? yes___ no___

9. Does the submittal contain enforcement/compliance strategies including how compliance will be determined in practice, and at what frequency? yes___ no___

10. Does the submittal contain special economic and technical justifications required by the USEPA policies, or explain why such justifications are necessary? yes___no___ not applicable___

United States Environmental Protection Agency

Office of Air and Radiation

**Review of Authorities Available for Tribal Air Program
Financial Assistance Grants**

April 19, 2002



Introduction

When EPA proposed its implementing regulations for §301(d) of the Clean Air Act (CAA) in August 1994, it recognized that tribes (to an even greater degree than states) would need financial assistance to support the development and implementation of tribal air programs. In the preamble to its proposal, EPA discussed at length the various mechanisms available to tribes for funding their air programs. Since that proposal was published, much has happened to stimulate interest in air programs in Indian country and many tribes have taken advantage of the authorities under the CAA and other statutes to begin developing programs.

This document is intended to reiterate the discussion EPA presented on financial assistance in the proposed rule (40 C.F.R. Parts 9, 35, 49, 50 and 81 Indian Tribes: Air Quality Planning and Management) and provides additional guidance on how these mechanisms might be used to advance the tribes' objectives in air quality management. However, this document is only a summary of available grant funds for CAA activities. EPA has developed formal procedures governing these activities and tribes should consult these procedures (see list at the end of this document) before they make formal application to EPA for a grant.

Background

As far back as the 1970's, a limited number of tribes were receiving funding from EPA to support air program development, usually focusing on air monitoring. With the proposal of the Tribal Authority Rule in 1994, the reaffirmation of the Agency's Indian policy, and more aggressive outreach to tribes on the opportunities available to them under the CAA, more tribes became interested in air quality management. However, the statutory requirements for tribes to provide a "match" on federal funding remained a significant barrier to tribes seeking funding. The elimination of the §103 match requirement in 1996 and the promulgation of the Tribal Authority Rule in 1998 (which reduced the match for §105 for eligible tribes from 40% to 5-10%) virtually eliminated the financial barriers to tribes with TAS seeking assistance to implement tribal air programs.

The elimination of these barriers and the aggressive training and outreach to tribes on air quality management has continued to increase the demand for federal resources to implement programs. More than one hundred tribes are already operating under CAA grants; many more have expressed interest in applying for new grants. EPA believes it is appropriate at this time to clarify in a single source document the various authorities for financial assistance available to tribes and factors that tribes might consider in choosing among these authorities.

Objectives of this overview

The objectives of this document are to:

- Describe the funding authorities available to provide grants for tribes to use to develop and implement tribal air programs;
- Explain the kinds of activities each of these authorities can fund;
- Promote national consistency on the use of these authorities, while continuing to respond flexibly to tribal needs; and
- Suggest strategies to tribes for optimizing the use of these authorities to develop and implement their programs.

National Consistency

Although EPA's Tribal Air Program is rooted in the principles of flexibility and decentralized management, it is important to make clear that a number of factors in the program are universally applicable and should be applied nationally.

- Since its first articulation in 1984, EPA's Indian Policy has always been that tribal governments should be viewed as the primary parties in managing their environments and should be consulted on any EPA action that affects the tribe. Tribal consortia are eligible for financial assistance if they meet the requirements outlined in 40 C.F.R. §35.504. Assistance is subject to the approval/concurrence of the consortium's member tribes, and eligibility requirements are different under the authorities for General Assistance Program and CAA §105.
- Financial assistance has been provided to tribes to begin conducting environmental assessments and to develop environmental program management capacity. As tribes develop a better understanding of their air quality problems and begin to consider the long term implications of managing air quality, they should become more interested in moving toward a long term commitment to an air quality management program.

Statutory authorities available

Eligible tribes may seek funding to develop tribal air programs under three separate authorities:

- Indian Environmental General Assistance Program (42 USC §4368b)
- Clean Air Act Project funding (CAA §103(b))
- Clean Air Act Program funding (CAA §105)
- Performance Partnership Grants (PL 104-134 and PL 105-65)

Each of these provisions offers opportunities and limitations that might affect a tribe's decision on the appropriate authority to use (in addition to the statutory limitations, tribal grants are subject to cost allowability limitations set forth in OMB Circular A-87). This document will attempt to outline those factors that tribes should consider as they look for financial assistance to develop air programs.

General Assistance Program

1. How can the General Assistance Program be used to undertake the development of an air quality program?

EPA's General Assistance Grant Program (GAP) provides resources to eligible tribes to plan, develop, and establish an environmental protection program. This includes building the administrative, technical, legal, enforcement, communications, and environmental education and outreach infrastructure.

Planning and development of an environmental protection program may include conducting a baseline assessment of environmental degradation for specific media (e.g., air, water, etc.). For instance, in developing an air pollution control program, a tribe could use GAP funds for a baseline assessment of air quality. A tribe could also use GAP funds for other activities in support of building its air quality program such as completing an air pollution emissions inventory or setting up an ambient air quality monitoring network to characterize the air quality of an Indian country area as part of building the capacity to operate and manage an environmental program. The GAP grant may include the funds necessary to complete the tasks (staffing, travel, training, etc.) including the purchase of equipment consistent with EPA's regulations at 40 C.F.R. Parts 31 and 35 and OMB Circular A-87. EPA regional offices should work closely with tribal governments as they develop their GAP grant work plans to incorporate media-specific activities as appropriate.

2. Are GAP grants competed?

Although GAP grants are not formally competed at the national level, the limited availability of GAP funding requires some Regional Offices to establish competitive processes for awarding GAP grants. In these cases, the Regional Office may require that all grant proposals be submitted within a certain time frame so that the work plans can be evaluated simultaneously. Although it is EPA's goal to be able to award a GAP grant to every tribe requesting one, it is sometimes necessary to negotiate work plans to reduce the level of effort and the funding required so that all tribes who apply can receive some form of assistance.

3. Why might a tribe choose the GAP authority rather than a CAA authority?

This funding might be of particular interest to tribes concerned about committing to an air pollution program infrastructure before they have a complete understanding of the air quality conditions within Indian country. Including a baseline multi-media assessment of Indian country in a GAP grant provides an avenue for a tribe to collect the data needed to make media-specific decisions about media program implementation without taking on the burden of managing a number of media program grants. For example, a tribe may have concerns about its aquatic resources and suspect air deposition as a pollution pathway. It may also be reluctant to take on multiple grants and a large staff just to find out if there is a problem. In this case, it might be appropriate for the tribe to work with EPA to develop a GAP work plan that would enable the tribe to build an environmental protection program that addresses both air and water pollution. A baseline assessment of both water quality and air quality could be conducted if it is in support of planning, developing, or establishing such a program.

4. Are there any limitations on a tribe's choosing the GAP authority?

Tribes should be aware that this authority is not appropriate “for the principal purpose of solving particular problems at particular places,” because they are not in support of planning, developing or establishing an environmental protection program. For instance, if a tribe has a concern about the transport of air pollution from a specific off-reservation source and wants to gather data on the impact of that source on its ambient air quality, it may be more appropriate to use one of the other available CAA grant authorities to complete the assessment.

Section 103 Authority

1. How can the Clean Air Act §103 authority be used to build tribal air programs?

CAA §103(a) establishes EPA's authority to “conduct, and promote the coordination and acceleration of, research, investigations, experiments, demonstrations, surveys, and studies relating to the causes, effects (including health and welfare effects), extent, prevention, and control of air pollution.” CAA § 103(b)(3) authorizes EPA to “make grants to air pollution control agencies, to other public or nonprofit private agencies, institutions, and organizations, and to individuals, for [these] purposes.” This broad authority has been used by many tribes to begin work on tribal air programs. Tribes have used the CAA §103 authority to begin air quality assessments, develop emissions inventories, and set up air quality monitoring networks to collect data on ambient air quality. A number of tribes have hired and trained air quality specialists to oversee the implementation of these activities.

2. Are there any limitations on the tribes' use of the §103 authority?

CAA §103 grants are project grants, and it is EPA's policy that these grants will not be approved for a performance period greater than five years. This limitation should not constrain tribes interested in assessing air quality and undertaking initial developmental activities since this kind of activity should generally not take more than five years to complete. It is also possible for tribes to seek multiple project grants under this authority as long as no single grant activity extends beyond five years in a single grant's cycle, and multiple grants are for distinctly different purposes. However, a §103 grant provides no guarantee of on-going funding beyond the project period.

The authority is not limited to "air pollution control agencies" or "an agency of an Indian tribe," which would narrow the field of eligibility (as with the 105 authority). As a project authority, §103 provides discretion to the Administrator to select those activities for funding that advance knowledge on the "causes, effects [. . .], extent, prevention, and control of air pollution." (CAA §103(a)(1)). Although EPA has established no formal evaluation and selection criteria for tribes applying for grants under this authority, it may be necessary to do so as resources become more limited.

Section 105 Authority

1. What is the purpose of CAA §105 grants?

EPA has been providing financial assistance to state pollution control agencies under the CAA §105 authority since the CAA was first authorized in 1970. The authority, however, has always limited the extent to which the federal government will fund a CAA program and required states to provide matching funds. Under the initial authorization, federal funding was limited to 75% of the total program; that requirement was changed by the 1990 amendments to limit the federal share of a CAA program to 60%. This authority provides for "implementing programs for the prevention and control of air pollution or implementation of national primary and secondary ambient air quality standards." (CAA §105(a)(1)(A)). The CAA further defines implementation as "any activity related to the planning, developing, establishing, carrying-out, improving, or maintaining of such programs." (CAA §105(a)(1)(A)). The authority is further restricted to state and regional air pollution control agencies as well as agencies of an Indian tribe, which have been eligible to receive funding under this authority in the same manner as states since the 1990 Clean Air Act amendments.

Eligible tribes have authority, if they choose to take it on, to develop and implement federally enforceable CAA programs. In addition, tribes who seek eligibility to receive a CAA §105 grant under the 40 C.F.R. §35.573(a) are also eligible for a reduced matching requirement (5% to 10%, depending on the situation). It is important to note that without the eligibility determination under 40 C.F.R. §49.6, tribes are required to provide a 40%

match and the tribes' must expend the same amount of tribal funds for recurrent CAA §105 activities as it expended in the previous year (maintenance of effort requirement CAA §105(c)), with no formal waiver provisions, in order to continue receiving §105 funds each ensuing year.

Tribes are generally eligible to receive §105 funding for operating ongoing air quality programs subject to certain limitations. Proposed programs must satisfy the requirements in 40 C.F.R. §35.511 including:

- Be consistent with 40 C.F.R. Part 31 (requirements involving grants);
- Be consistent with all applicable federal statutes; regulations; circulars; executive orders; and EPA delegations, approvals, or authorizations;
- Be feasible, considering the applicant's existing circumstances, past performance, program authority, organization, resources, and procedures (40 C.F.R. part 35.511(a)(4)).

A tribe seeking funding under §105 would have to work with the Regional Office to ensure that these requirements are fulfilled. These requirements are not intended to act as obstacles, but provide assurance that funding is being used as intended by Congress.

2. Must a tribe address additional requirements to receive the reduced match?

A tribe seeking eligibility to receive a CAA §105 program grant with a reduced match must apply for eligibility under 40 C.F.R. part 49.6. A tribe must document that:

- (1) The applicant is an Indian tribe recognized by the Secretary of the Interior;
- (2) The Indian Tribe has a governing body carrying out substantial governmental duties and functions;
- (3) The functions to be exercised by the Indian Tribe pertain to the management and protection of air resources within the exterior boundaries of the reservation or other areas within the tribe's jurisdiction; and
- (4) The Indian Tribe is reasonably expected to be capable, in the EPA Regional Administrator's judgment, of carrying out the functions to be exercised in a manner consistent with the terms and purposes of the Clean Air Act and all applicable regulations.

If a tribe has already been determined "eligible" under another environmental statute or under the CAA for another program, it need only identify the prior authorization and provide the required information which has not been submitted in the previous application (40 C.F.R. 49.7(a)(8)).

3. May a tribe seek a waiver for the CAA §105 match requirement?

Even with the reduced match, EPA recognizes that the economic circumstances of some tribes may preclude them from providing this small match. The Agency’s regulation at 40 C.F.R. §35.575(a) provides discretion to the Regional Administrator to “increase the maximum federal share if the Tribe or Intertribal Consortium can demonstrate in writing that the fiscal circumstances within the Tribe or within the member Tribes of the Intertribal Consortium are constrained to such an extent that fulfilling the match requirement would impose undue hardship.” This applies only to tribes found eligible under 40 C.F.R.49.6.

4. What are the advantages of §105 funding to tribal governments?

The principal advantage to a tribe is some assurance of continued funding in the future. As indicated above, tribes have access to this authority in two ways, through the statute itself as an “agency of a tribe” or through the TAS eligibility determination process. The CAA statute provides that “no application by a State [or a tribe] for a grant under this section may be disapproved by the Administrator without prior notice and opportunity for a public hearing in the affected State, and no commitment or obligation of any funds under any such grant may be revoked or reduced without prior notice and opportunity for a public hearing in the affected State.” (CAA §105(e)).

EPA has provided in its recently promulgated revisions to the grant regulations similar assurances of continued financial assistance. That provision reads: “The Regional Administrator will not disapprove an application for, or terminate or annul an award of, financial assistance under §35.573 without prior notice and opportunity for a public hearing with the appropriate jurisdiction. . . .” (40 C.F.R. §35.578). Unlike the CAA §103 authority, which is project oriented and time limited, the §105 authority provides financial assistance for ongoing programs and will not be terminated without notice and an opportunity for public hearing.

Another advantage for a tribe pursuing a CAA §105 grant is that this kind of financial assistance can be incorporated into a Performance Partnership Grant.

Performance Partnership Grants (PPGs)

1. What is the role of Performance Partnership Grants?

EPA is authorized to award Performance Partnership grants (PPGs) to tribes and tribal consortia. PPGs enable Tribes and Tribal Consortia to combine funds from more than one environmental program grant into a single grant with a single budget under streamlined administrative requirements (40 C.F.R. §35.530(b)). Environmental program grant funds eligible for a PPG include the General Assistance Program (GAP) and Clean

Air Act §105 funds. CAA §103 grant funds are not available for inclusion in a PPG (see 40 C.F.R. §35.553).

PPGs offer many benefits to tribes. They offer opportunities to strengthen their partnership with EPA through joint planning and priority setting. They allow tribes to direct resources to those areas with the highest priority. They allow tribes to link program activities more effectively with their environmental and public health goals. And, by consolidating several programs, PPGs reduce the administrative burden of managing several grants on the tribe. A tribe looking to develop an integrated environmental management program that includes an air quality protection program might apply for CAA §105 funding (rather than a CAA §103 grant) in order to be able to include it in a PPG with funds from other eligible programs.

For tribes eligible for §105 grants that have not established eligibility for Treatment as a State, PPGs offer an option to receive funding under §105 with a reduced match. The PPG cost share (match plus maintenance of effort) is the sum of the cost shares required for all individual program grants included in the PPG, but for funds from programs with a required cost share of greater than 5%, EPA will only require a 5% cost share. However, after the first two years, it may be raised to 10%. All tribes eligible for §105 grants may be eligible for a waiver of the cost share in a PPG (see 40 C.F.R. §35.536). This affords an additional opportunity for tribes unwilling or unable to apply for a grant as an eligible tribe under 40 C.F.R. §35.573(a).

Source Documents:

Indian Tribes: Air Quality Planning and Management (40 C.F.R. Part 49)

Environmental Program Grants for Tribes (40 C.F.R. Part 35 subpart B)

Office of Air and Radiation FY 2002 National Program Guidance

Office of Air and Radiation FY 2002 Grant Guidance

OMB Circular A-87: Cost Principles for State, Local, and Indian Tribal Governments

OMB Circular A-102: Uniform Administrative Requirements for Grants and Agreements with State and Local Government. 40 C.F.R. Part 31.

Frequently Asked Questions

1. What are the key differences between the CAA §103 and §105 authorities?

Section 103 authority is a project-oriented grant. Activities under this authority are for efforts like research, investigations and surveys, and tribes have used §103 grants for activities associated with setting up air quality programs. These activities include initial air quality assessments, emission inventories, gathering monitoring data to understand air quality within Indian country, attending air quality training courses, preparing outreach to tribal members and becoming involved with local, regional and national planning and policy efforts. Section 105 grants are program grants provided to tribes to carry out ongoing air quality programs. The key difference is that ongoing activities like long term monitoring networks, inspections and enforcement, regulatory development and similar activities which are part of an ongoing air program should be funded by §105. Another key difference is that a §105 grant typically requires that a Tribe share some of the cost of the work plan budget.

2. When should a tribe consider moving from a §103 grant to a §105 grant? Can a tribe be granted a §103 grant and a §105 grant at the same time?

Tribes typically should move to §105 funding when their research and investigation under §103 funding enables them to determine that an ongoing air quality program is needed or desired by the tribe. A number of factors could be important in making this decision, and a primary factor would likely be the quality of the air within Indian country. Tribes in areas not meeting national or tribal standards would likely want to carry out a §105 program to address air quality issues both on the reservation and in non-reservation areas within their jurisdiction. In many cases, a tribe may have good air quality but still be concerned with impacts from sources outside of Indian country as well as issues such as long range transport and regional haze. The tribe might wish to maintain some ongoing air quality expertise and capacity in order to review and comment on permits for sources affecting their airshed, carry out an outreach program for tribal and neighboring communities, and participate in local, regional and national planning and policy efforts.

It is possible and not unusual for tribes (and other eligible grantees) to be funded under both authorities at the same time. In some instances, as a tribal air program develops, the tribe might choose to fund their ongoing activities under §105 while retaining funding for project activities under §103 until they are completed. In addition, a tribe being funded under §105 that wishes to carry out a new project, can apply for §103 funding for that project while continuing with ongoing §105 activities. These activities can be carried out concurrently but should be accounted for and reported as separate grants.

3. How can a tribe meet the match requirement under a §105 grant?

There are three options for meeting the match requirements under §105. The most common way is to provide 5 or 10% of the grant (if required) from tribal funding sources. This would often be drawn from a “general” fund maintained by the tribe, but could be provided from any source of tribal revenue excluding all funds provided to the tribe by the federal government, with the exception of federal funds specifically allowed by statute to be used for match. See 40 C.F.R. §31.24(b)(1) (e.g. funds provided under PL 638). A tribe may also provide a match through “in kind” sources, commonly contributions to the program from other tribal personnel, or through the provision of office space, supplies or overhead costs. This type of contribution would need to be supported by documentation quantifying its value. The third option available to tribes is to demonstrate hardship in providing match and apply to the Regional Administrator for a waiver. This generally takes the form of a letter describing to the Regional Administrator how the fiscal situation of the tribe prohibits the provision of matching funds.

Note that for tribes choosing not to seek TAS eligibility to receive §105 funds under 40 C.F.R. §35.573(a), the statutory requirement to provide a 40% match remains in effect. However, those tribes without TAS may reduce the match requirement by including the §105 funds in a PPG.

4. Under what circumstances can the match requirement for §105 grants under 40 C.F.R. §35.575(a) be waived?

Tribes are eligible for a waiver of the 5 or 10% match requirement at the discretion of the Regional Administrator. A tribe would write to the Regional Administrator and present information to demonstrate that providing the matching amount would cause the tribe undue hardship.

5. For a tribe applying for CAA §105 funds as an eligible tribe under 40 C.F.R. §49.6, how can it meet the “reservation or other areas within the tribe’s jurisdiction” requirement?

To show that the tribe meets the “reservation” requirement, a tribe needs to show “with clarity and precision the exterior boundaries of the reservation including, for example, a map and a legal description of the area.” 40 C.F.R. §49.7(a)(3). For applications concerning “other areas within the tribe’s jurisdiction,” the tribe should include a map or legal description of the area covered by the application and a statement by the applicant’s legal counsel that describes the basis for the tribe’s assertion of authority over that area for purposes of the grant.

To satisfy the capability requirement, the tribes must be reasonably expected to be capable of carrying out the functions to be exercised in a manner consistent with the terms and purposes of the Clean Air Act and all applicable regulations. A tribe should

include a narrative statement describing the capability of the tribe to carry out the functions to be exercised under the grant. The narrative statement may include a description of: (1) the Tribe's previous management experience; (2) existing environmental or public health programs administered by the Tribe; (3) the agency or office that will carry out the primary functions to be exercised under the grant; and (4) the technical and administrative capabilities of the staff to administer and manage the functions to be exercised or a plan which proposes how the tribe will acquire administrative and technical expertise. EPA recognizes that certain tribes may not have substantial experience administering environmental programs. A lack of experience will not preclude a Tribe from demonstrating the required capability. Rather, Tribes should show that they either have the necessary management and technical skills or submit a plan detailing steps for acquiring those skills.

6. Are there specific activities that are allowed or not allowed under the authorities for §103 and §105?

While specific activities are generally decided by the Regional Offices, there are some principles required by OMB Circulars that apply to all granting offices. As discussed earlier, §103 activities should be research and demonstration projects with a distinct duration and result. As part of a project, a tribe would generally be investigating their air quality through inventories, assessments and monitoring. In addition, the tribe could be developing their capacity to operate an air quality program by attending training, and networking with their peers at local, regional and national meetings and events involving the discussion and creation of air quality policies such as regional haze planning.

Under the §105 authority, many of these same activities would be allowable, as well as additional activities such as regulatory development, inspection of sources, major and minor source permitting, and ongoing monitoring efforts. The principle difference is an air quality project compared to an ongoing air quality program, and the activities may be similar, but have a different objective.

Please note that these lists are not inclusive and Regional Offices have some flexibility in allowing tasks that they find appropriate to be performed under either grant authority.

7. What are the requirements to assure the quality data being developed by tribes?

Many tribal programs are expected to undertake projects or programs which involve the collection or creation of environmental data, (an example is ambient monitoring). While there is some flexibility in the Regional offices regarding how this requirement is implemented, in general, tribes must have an approved quality assurance project plan (QAPP) to assure the quality of data being collected or created, prior to beginning the part of the project or program that involves data collection (40 C.F.R. §31.45). An EPA guidance document is available at <http://www.epa.gov/quality1/qs-docs/r5-final.pdf>, and the Institute For Tribal Environmental Professionals and Northern Arizona University offers regular workshops for tribes to learn how to develop these plans.

8. Can a tribe use federal financial assistance to defend itself in court?

Reimbursement of legal expenses is governed by the cost principles in OMB Circular A-87. Funds from either §103 or §105 should be used for activities stated and approved as part of the project workplan. In addition, consistent with the Agency's annual appropriation act, a chief executive officer of every assistance recipient is required to certify that none of the federal funds were used to lobby the federal government or in litigation against the United States unless authorized under existing law.

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Acronym List

AIRS-AQS	Aerometric Information Retrieval System - Air Quality System database (EPA)
AILESP	American Indian Lands Environmental Support Project (EPA)
BACT	Best Available Control Technology
BACM	Best Available Control Measures
CAA	Clean Air Act
CATC	Clean Air Technology Center (EPA)
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
CHIEF	Clearinghouse for Inventories and Emissions Factors (EPA)
C/MSA	Consolidated Metropolitan Statistical Area
CO	Carbon Monoxide
EIIP	Emissions Inventory Improvement Program (EPA)
EMC	Emissions Monitoring Center (EPA)
EPA	Environmental Protection Agency
FIP	Federal Implementation Plan
GCVTC	Grand Canyon Visibility Transport Commission
HAPs	Hazardous Air Pollutants
IPP	Inventory Preparation Plan
LAER	Lowest Achievable Emission Rate
MACT	Maximum Achievable Control Technology
minor NSR	Minor Source New Source Review
MSA	Metropolitan Statistical Area
NA	Nonattainment
NAAQS	National Ambient Air Quality Standards
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NET	National Emissions Trends database (EPA)
NETI	National Enforcement Training Institute (EPA)
NO ₂	Nitrogen Dioxide
NSPS	New Source Performance Standards

NSR	New Source Review (for major sources in either attainment or nonattainment areas)
NTIS	National Technical Information Service
OECA	Office of Enforcement and Compliance Assurance (EPA)
O ₃	Ozone
Pb	Lead
PM ₁₀	Particulate Matter with a diameter less than or equal to 10 micrometers
PM _{2.5}	Particulate Matter with a diameter less than or equal to 2.5 micrometers
ppm	Parts per million (a unit of measurement)
PSD	Prevention of Significant Deterioration program (New Source Review for attainment areas)
QA/QC	Quality Assurance / Quality Control
RACM	Reasonably Available Control Measures
RACT	Reasonably Available Control Technology
RFP	Reasonable Further Progress
SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
TAMS	Tribal Air Monitoring Support Center
TAR	Tribal Air Rule
TIP	Tribal Implementation Plan
Fg/m ³	Micrograms per cubic meter of air (a unit of measurement)
VOC	Volatile Organic Compounds
WRAP	Western Regional Air Partnership

Glossary

acid deposition - the process by which acidic particles, gases, and precipitation leave the atmosphere. Although it is more commonly referred to as acid rain, acid deposition has two components: wet deposition (through snow, rain, and fog) and dry deposition (through the settling of gases and particles out of the atmosphere).

acid rain - primarily the result of sulfur dioxide (SO₂) and nitrogen oxides (NO_x) reacting in the atmosphere with water and returning to earth as rain, fog, or snow. This term is broadly used to include both wet deposition and dry deposition (through the settling of gases and particles out of the atmosphere).

Aerometric Information Retrieval System (AIRS-AQS) - a database with easily-retrieved information on the levels of the criteria pollutants in all areas of the country. The EPA's procedures for reporting and using data ensure timely and widespread access to accurate information. The public may browse and obtain reports from AIRS-AQS at www.epa.gov/airs/.

ambient air - any unconfined portion of the atmosphere; open air, surrounding air.

area source - any small source of non-natural air pollution that is released over a relatively small area but which is not classified as a point source. Such sources may include vehicles and other small engines, small businesses, and household activities.

attainment area - an area considered to have air quality as good as or better than the national ambient air quality standards as defined by the Clean Air Act. An area may be an attainment area for one pollutant and a nonattainment area for others.

baseline - the ambient concentration level of a pollutant that exists at the time of the first application for a PSD permit. The baseline concentration is established for each pollutant (and relevant averaging time). In areas with a PSD program, ambient air concentration levels may not exceed the baseline plus an established increment.

Best Available Control Measures (BACM) - a term used to refer to the most effective measures (according to EPA guidance) for controlling small or dispersed particulates from sources such as roadway dust, soot and ash from woodstoves and open burning of brush, timber, grasslands, or trash.

Best Available Control Technology (BACT) - an emission limitation based on the maximum degree of emission reduction (considering energy, environmental, and economic impacts) achievable through application of production processes and available methods, systems, and techniques. BACT does not permit emissions in excess of those allowed under any applicable CAA provisions. Use of the BACT concept is allowable on a case by case

basis for major new or modified emission sources in attainment areas (used under the Prevention of Significant Deterioration program) and applies to each regulated pollutant.

biogenic source - non-manmade or natural emitter of air pollutants. For example, conifer trees emit terpenes which are volatile organic compounds, a precursor to ozone.

carbon monoxide (CO) - a colorless, odorless, poisonous gas produced by incomplete fossil fuel combustion. CO is a criteria pollutant regulated under NAAQS.

Class I, II, and III attainment areas - classifications of attainment/unclassifiable areas established in the CAA. Class I areas are held to the strictest air pollution standards; Class III areas allow for the greatest amount of emissions of criteria pollutants. "Federal Class I" areas are the Class I areas created in the CAA: national wilderness areas and national memorial parks greater than 5,000 acres, national parks greater than 6,000 acres, and international parks. Additional areas have since been reclassified as Class I areas. Class II areas initially were all those areas that were in attainment or unclassifiable that were not established as Class I areas. Class II areas can be redesignated as Class I or Class III areas.

Clean Air Act (CAA) - the basis of U.S. clean air programs. The original CAA passed in 1970 and was amended in 1977 and 1990. It is comprised of nine sections or Titles that cover, in order, the National Ambient Air Quality Standards, mobile sources, hazardous air pollutants, acid-deposition control, stationary source operating permits, stratospheric ozone and global climate protection, enforcement, miscellaneous provisions, and clean air research.

continuous emission monitoring systems (CEMS) - the total equipment necessary for determining the gas or particulate matter concentration or emission rate using pollutant analyzer measurements and a conversion equation, graph, or computer program to produce results in units of the applicable emission limitation or standard. CEMS are required under some of the EPA regulations for either continual compliance determination or determination of exceedances of the standards.

Code of Federal Regulations (CFR) - a codification of the general and permanent rules published in the *Federal Register* by the executive departments and agencies of the federal government. The CFR is divided into 50 titles which represent broad areas subject to Federal regulation. Title 40 consists of regulations related to protection of the environment. The CFR is available online at www.access.gpo.gov/nara/cfr/index.html.

Clearinghouse for Inventories and Emissions Factors (CHIEF) - an on-line resource (www.epa.gov/ttn/chief/) with information on emissions factors, emissions inventories, and emissions estimation software.

contingency measures - the part of an attainment strategy that provides extra emission reductions if your basic control strategy fails to achieve reasonable further progress or fails to attain

the primary NAAQS on schedule. Contingency measures should accomplish about one year's worth of progress toward meeting the NAAQS or an additional 20 to 25% of the emissions being reduced.

criteria pollutants - pollutants known to be hazardous to human health for which the 1970 amendments to the Clean Air Act required EPA to set National Ambient Air Quality Standards (NAAQS). EPA has identified and set standards to protect human health and welfare for six pollutants: ozone (O₃), carbon monoxide (CO), total suspended particulates (also known as particulate matter or PM), sulfur dioxide (SO₂), lead (Pb), and nitrogen dioxide (NO₂). The term, "criteria pollutants," derives from the requirement that EPA must describe the characteristics and potential health and welfare effects of these pollutants. It is on the basis of these criteria that standards are set or revised.

design value - the ratio of current pollutant concentration to the National Ambient Air Quality Standards (NAAQS). A design value greater than one indicates the area is in violation of the NAAQS for that pollutant.

eligible tribe - a tribe that has received a determination of eligibility to run CAA programs (formerly known as "treatment in the same manner as a state"). To become eligible, your tribe must demonstrate federal recognition, have a governing body carrying out substantial governmental duties and powers, provide evidence it will perform functions pertaining to the management and protection of air resources within its jurisdiction, and demonstrate the capability to implement the programs for which it is seeking approval.

emission - pollution discharged into the atmosphere from smokestack, other vents, and surface areas of commercial or industrial facilities; from residences; and from motor vehicle, locomotive, or aircraft exhausts.

emissions factor - a ratio that relates emissions of a pollutant to an activity level at a plant that can be easily measured, such as the amount of material processed or an amount of fuel consumed. Given an emissions factor and a known activity level, multiplication yields an estimate of emissions.

emissions inventory - a listing, by source, of the amount of air pollutants discharged into the atmosphere of a geographic area.

Emissions Inventory Improvement Program (EIIP) - a jointly sponsored effort of the State and Territorial Air Pollution Program Administrators/Association of Local Air Pollution Control Officials and EPA. The goal of EIIP is to provide cost-effective, reliable inventories by improving the quality of emissions information and developing systems for collecting, calculating, and reporting emissions data. The primary guidance on inventory development is summarized in the *EIIP Document Series, Volumes I-X*, accessible through the EIIP website (www.epa.gov/ttn/chief/eiip/).

emission standard - the maximum amount of air polluting discharge legally allowed from a single source, mobile or stationary.

emissions trading - EPA policy that allows a plant complex with several facilities to decrease pollution from some facilities while increasing it from others, so long as total results are equal to or better than previous limits. Facilities where this is done are treated as if they exist in a bubble in which total emissions are averaged out. Complexes that reduce emissions substantially may “bank” their “credits” or sell them to other industries.

enforcement - EPA, state, tribal, or local legal actions to obtain compliance with environmental laws, rules, regulations, or agreements and/or obtain penalties or criminal sanctions for violations. Enforcement proceedings may vary, depending on the requirements of different environmental laws and related implementing regulations.

Federal Implementation Plan (FIP) - under current law, a federally implemented plan to achieve attainment of air quality standards, used when a state or a tribe is unable to develop an adequate plan.

federal land manager - with respect to any lands owned by the government of the United States, the Secretary of the department with authority over such lands. Four agencies administer the majority of this land: the Forest Service (in the Department of Agriculture), the Bureau of Land Management, the Fish and Wildlife Service, and the National Park Service (in the Department of the Interior). Management authority may be delegated to regional or local officials, such as the Regional Forester or the individual Forest Supervisor for Forest Service lands.

fugitive emissions - sources of emissions that do not come from an exhaust stack or vent and are not collected or controlled. Fugitive emissions may escape from buildings or come from unconfined activities such as outdoor materials storage piles swept by wind and surface mining activities.

geogenic sources - natural sources that create pollution, such as oil and natural gas seeps which emit ozone precursors (VOCs and NO_x), volcanoes which emit PM and SO_2 , and wind that blows dust from natural areas, creating PM.

Grand Canyon Visibility Transport Commission (GCVTC)- a regional planning group that developed a strategy for dealing with visibility impacts in the national parks and wilderness areas on the Colorado Plateau. The GCVTC was comprised of tribal, state, and federal representatives. Once the GCVTC made its recommendations, the Western Regional Air Partnership (WRAP) was formed to implement them.

Hazardous Air Pollutants (HAPs) - 188 air pollutants that are not covered by ambient air quality standards, but which, as defined in Title III of the Clean Air Act, may reasonably be expected to cause or contribute to irreversible illness or death. Such pollutants include

asbestos, beryllium, mercury, benzene, coke oven emissions, radionuclides, and vinyl chloride.

increment - the maximum allowable increase in concentration that is allowed to occur above a baseline concentration for a pollutant in areas with a PSD program. Class I areas have the smallest increments and thus allow only a small degree of air quality deterioration. Class III areas have the largest increments and therefore allow for a larger amount of development than either Class I or Class II areas.

inventory preparation plan (IPP) - a concise, prescriptive document that states exactly how you intend to develop and present your inventory. The IPP should include inventory objectives and general procedures, and should clearly describe how you will present and document the inventory for submission to EPA and/or others.

knowing violation - a violation in which the responsible party is aware of an environmental regulation, yet still takes an action that causes the regulation to be violated.

lead (Pb) - a heavy metal that is hazardous to health if breathed or swallowed. Its use in gasoline, paints, and plumbing compounds has been sharply restricted or eliminated by federal laws and regulations. Lead is a criteria pollutant regulated under NAAQS.

Lowest Achievable Emission Rate (LAER) - under the Clean Air Act, the rate of emissions that reflects (a) the most stringent emission limitation in the implementation plan of any state for such source unless the owner or operator demonstrates such limitations are not achievable; or (b) the most stringent emissions limitation achieved in practice, whichever is more stringent. A proposed new or modified source may not emit pollutants in excess of existing new source standards. LAER is usually required in nonattainment areas under the New Source Review program.

major modification - any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the CAA. See 40 CFR 51.165(a)(1)(v)(A).

major stationary source - a source that emits, or has the potential to emit, 100 tons per year or more of any pollutant subject to regulation under the CAA. See 40 CFR 51.165(a)(1)(iv)(A).

minor stationary sources - any stationary source of air pollutants that does not meet the definition of a major stationary source.

mobile source - any non-stationary source of air pollution such as cars, trucks, motorcycles, buses, airplanes, and locomotives.

minor New Source Review (minor NSR) program - applies in both attainment and nonattainment areas to smaller new facilities and expanding facilities that are not large enough to qualify as major new sources or major modifications.

National Ambient Air Quality Standards (NAAQS) - national standards for pollutants considered harmful to public health and the environment. The Clean Air Act requires EPA to set NAAQS and established two types of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The EPA Office of Air Quality Planning and Standards (OAQPS) has set NAAQS for six principal pollutants, which are called "criteria" pollutants: ozone, carbon monoxide, total suspended particulates (also known as particulate matter), sulfur dioxide, lead, and nitrogen dioxide.

National Emissions Standards for Hazardous Air Pollutants (NESHAPs) - emissions standards set by EPA for an air pollutant not covered by the National Ambient Air Quality Standards (NAAQS) that may cause an increase in fatalities or in serious, irreversible, or incapacitating illness.

New Source Performance Standards (NSPS) - uniform national EPA air emission and water effluent standards which limit the amount of pollution allowed from new sources or from modified existing sources.

National Emissions Trends (NET) Database - a national database that blends state and locally supplied data with EPA derived data to form a comprehensive national inventory of criteria and toxic pollutants. The NET inventory does not necessarily include state data for any particular source or pollutant. However, in the 1996 NET inventory, EPA intends to provide statewide emissions inventory data on a county level basis to every state in the country. The NET is accessible at www.epa.gov/ttn/chief/net/index.

new source - any stationary source built or modified after publication of final or proposed regulations that prescribe a given standard of performance.

New Source Review (NSR) preconstruction permitting program - requires all new major sources or existing sources with major modifications in both nonattainment areas and attainment areas to obtain preconstruction permits. The nonattainment NSR and the Prevention of Significant Deterioration (PSD) programs, collectively known as major NSR, are federal regulations under the CAA. The programs focus primarily on the criteria pollutants regulated by the NAAQS. See also "minor New Source Review," "nonattainment New Source Review," and "Prevention of Significant Deterioration."

nitrogen dioxide (NO₂) - the result of nitric acid combining with oxygen in the atmosphere; major component of photochemical smog; a criteria pollutant regulated under NAAQS.

nonattainment area - an area that does not meet one or more of the National Ambient Air Quality Standards for the criteria pollutants designated in the Clean Air Act.

noncriteria pollutant - an air pollutant other than one of the six criteria pollutants [ozone (O₃), carbon monoxide (CO), particulate matter (PM), sulfur dioxide (SO₂), lead (Pb), and nitrogen dioxide(NO₂)].

nitrogen oxide (NO_x) - a product of combustion from transportation and stationary sources and a major contributor to the formation of ozone in the troposphere and to acid deposition.

nonattainment New Source Review (nonattainment NSR) preconstruction permitting program - in areas where air quality is worse than the NAAQS, this program prevents increases in emissions from major new sources and major modifications of existing sources and thus ensures progress toward meeting the standards. To obtain a permit under NSR, a facility must install control equipment ensuring the Lowest Achievable Emission Rate (LAER) and obtain emission “offsets” or reductions from other sources equal to the increased pollutant emissions.

offsets - emissions reductions obtained from existing source(s) by a prospective major new stationary source, or a source planning major modifications, in order to offset the increase in pollutant emissions caused by the new or modified source (thereby creating no net increase in emissions). Offsets are generally secured from other sources in the vicinity of the new source or modification. However, in the case of modifications, offsets can also be obtained, with limitations, from the source itself.

opacity - the amount of light obscured by particulate pollution in the air; clear window glass has zero opacity, a brick wall is 100 percent opaque. Opacity is an indicator of changes in performance of particulate control systems.

ozone (O₃) - found in two layers of the atmosphere, the stratosphere and the troposphere. In the stratosphere (the atmospheric layer 7 to 10 miles or more above the earth’s surface), ozone is a natural form of oxygen that provides a protective layer shielding the earth from ultraviolet radiation. In the troposphere (the layer extending up 7 to 10 miles from the earth’s surface), ozone is major component of smog. It can seriously impair the respiratory system and is one of the most widespread of all the criteria pollutants for which the Clean Air Act required EPA to set standards. Ozone in the troposphere is produced through complex chemical reactions of nitrogen oxides, which are among the primary pollutants emitted by combustion sources; hydrocarbons, released into the atmosphere through the combustion and processing of petroleum products; and sunlight.

particulates - fine liquid or dust particles such as dust, smoke, mist, fumes, or smog, found in air or emissions; particulate matter is a criteria pollutant regulated under NAAQS.

permit - an authorization, license, or equivalent control document issued by EPA or an approved state or tribal agency to implement the requirements of an environmental regulation; e.g., a permit to operate a wastewater treatment plant or to operate a facility that may generate emissions.

particulate matter (PM) - (1) PM_{10} - a standard for measuring the amount of solid or liquid matter suspending in the atmosphere, i.e., the amount of particulate matter over 10 micrometers (Fm) in diameter; smaller PM_{10} particles penetrate to the deeper portions of the lung, affecting sensitive populations groups such as children and individuals with respiratory ailments. (2) $PM_{2.5}$ - particulate matter greater than or equal to 2.5 Fm in diameter. PM is a criteria pollutant regulated under NAAQS.

point source - a stationary location or fixed facility from which pollutants are discharged; any single identifiable source of pollution, e.g., a pipe, ditch, ship, ore pit, factory smokestack.

potential to emit - emission estimates for a source based on the maximum capacity of that source, taking into consideration enforceable permit conditions, such as the type of materials combusted, the type of materials processed, and the annual hours of operation.

precursor - a substance from which another substance is formed; ozone precursors, such as NO_2 and VOC, react in sunlight to form ozone.

Prevention of Significant Deterioration preconstruction permitting program (PSD) - an EPA program in which state, tribal, and/or federal permits are required in order to restrict emissions from new or modified sources in places where air quality already meets or exceeds primary and secondary ambient air quality standards.

public comment period - the time allowed for the public to express its views and concerns regarding an action by the EPA or other regulating authority (e.g., a *Federal Register* notice of proposed rule-making or a public notice of a draft permit).

quality assurance/quality control (QA/QC) - a system of procedures, checks, audits, and corrective actions to ensure that all EPA research design and performance, environmental monitoring and sampling, and other technical and reporting activities are of the highest achievable quality.

reasonably available control measures (RACM) - a broadly defined term referring to technological and other measures for pollution control.

reasonably available control technology (RACT) - control technology that is both reasonably available, and both technologically and economically feasible. RACT is usually applied to existing sources in nonattainment areas; in most cases it is less stringent than new source performance standards.

reasonably severable - means that the TIP elements selected for the TIP must be able to stand alone and meet applicable CAA and regulatory requirements

source - any activity that causes pollutants to be emitted into the air. A stationary source is a fixed-site producer of pollution, such as power plants, industrial facilities, and gas stations. A mobile source is any non-stationary source of air pollution such as cars, trucks, motorcycles, buses, airplanes, and locomotives. A major source is one that emits, or has the potential to emit, pollutants over a major source threshold. A minor source is any source which emits less pollutants than the major source threshold.

State Implementation Plan (SIP) - EPA approved state plans for the establishment, regulation, and enforcement of air pollution standards. A detailed description of the programs a state will use to carry out its responsibilities under the *Clean Air Act*. Collections of regulations used by the state to reduce air pollution.

sulfur dioxide (SO₂) - a pungent, colorless, gaseous pollutant formed primarily by the combustion of fossil fuels.

stationary source - a fixed-site producer of pollution, such as power plants, industrial facilities, and gas stations.

synthetic minor - a source with major source potential to emit that agrees to enforceable emission limits below the major source threshold. Synthetic minor provisions can be included in minor New Source Review programs.

tribal air program - a program that incorporates technical, administrative, and outreach elements to address air quality concerns on a reservation or other area under a tribe's jurisdiction. Technical elements in a tribal air program may include identifying emission sources, establishing and maintaining an emissions inventory, collecting meteorological data, monitoring air quality, rule-making, and enforcing rules.

Tribal Authority Rule (TAR) - The TAR identifies eligibility criteria for tribes seeking to implement CAA programs and defines the process for EPA approval of tribal CAA programs. The TAR was issued on February 12, 1998 (63 Federal Register 7254) and the regulatory provisions codified at 40 CFR Section 49.

Tribal Implementation Plan (TIP) - a practical and enforceable plan, the primary purpose of which is to ensure that the National Ambient Air Quality Standards (NAAQS) are not violated. Tribes may choose to develop TIPs, whereas states are required to develop state implementation plans (SIPs). The EPA may develop and implement a federal implementation plan (FIP), where necessary or appropriate, for areas of Indian Country where the tribe is unable to or chooses not to develop an implementation plan that meets EPA approval.

volatile organic compounds (VOCs) - any organic compound that participates in atmospheric photochemical reactions, except those designated by EPA as having negligible photochemical activity. Atmospheric photochemical reactions can transform VOCs into ozone.

Western Regional Air Partnership (WRAP) - the organization created to implement the Grand Canyon Visibility Transport Commission's (GCVTC) recommendations for dealing with visibility impacts in the national parks and wilderness areas on the Colorado Plateau. The WRAP's goal is to "promote and monitor the implementation of the recommendations from the GCVTC and, with the concurrence of its members, engage in other common regional air quality issues." The members of WRAP include governors from western states, western tribal leaders, and representatives of the Departments of Agriculture and Interior, and EPA.