Air Quality Division
January 1993 Monthly Report

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STATE ACTIVITIES

Grand Canyon Visibility Transport Commission (GCVTC): Committee meetings of the GCVTC were held January 12-15 in San Diego, California, including the first meeting of the Public Advisory Committee (PAC). Primary objectives for the meeting included fine tuning the work plan schedule, soliciting feedback from the PAC, and receiving the results of the National Academy of Sciences (NAS) and Environmental Protection Agency (EPA) visibility reports. The release of the NAS Report on Regional Haze at the meeting bolsters the Commission's charge to recommend regulatory approaches to EPA for preventing and remedying visibility impairment in Grand Canyon National Park. A summary of the report's findings is attached to this monthly report. While preliminary at the time, EPA's report indicates that there would be essentially no change in western regional visibility conditions for Class I areas through the year 2005 as a result of the 1990 Clean Air Act Amendments. In fact, additional control measures may be needed to "hold the line" on existing visibility conditions for any eventual growth in emissions beyond EPA's projections for the year 2005.

Current plans for the GCVTC include: 1) a review of the NAS report (and EPA's report, if available) by mid-March to determine the extent to which the GCVTC's work plan is satisfied; 2) a meeting of committee chairs in Denver, March 18-19, to clarify who is responsible for each task and to firm up the schedule to assure that commitments are met; and 3) a public workshop on regulatory options, April 18-20 in Albuquerque, preceded by the second meeting of the PAC. (Brian Mitchell, Mark Scruggs, Molly Ross, Karen Malkin, Bill Malm, Carl Bowman, and Bob Chandler - GRCA)

OUTREACH ACTIVITIES

Big Thicket National Preserve: The Air Quality Division (AQD) received a request from the superintendent at Big Thicket National Preserve for technical and financial assistance for the development of an air quality wayside exhibit. The proposed exhibit will inform park visitors about air quality conditions at the preserve. The AQD will assist with the planning, designing, and funding for the exhibit. (Dee Morse)

Sleeping Bear Dunes National Lakeshore: A wayside exhibit plan for Sleeping Bear Dunes NL was approved by the AQD. The exhibit will inform park visitors about air pollution and how it affects resources at the lakeshore. The AQD transferred funds to the lakeshore for the construction of the exhibit. (Morse)

Air Quality Related Value (AQRV) Committee: The AQD has formed an in-house AQRV Committee, consisting of representatives from all three AQD branches and the USFWS Air Quality Branch, to begin identifying specific AQRVs and pollutant

sensitivity levels in NPS and FWS areas. The Committee is currently working on 3 projects: 1) developing and disseminating a generic Servicewide AQRV statement, 2) developing a survey to be sent to all air quality coordinators and Class I units, which will help us produce an AQRV list that is specific to each park/refuge, and 3) developing a long-term strategy to address this issue. Identifying AQRVs and sensitivity levels for each of the 48 NPS and 21 FWS Class I areas will be a difficult task that will require time and effort on the part of AQD, regional, and Class I area staff. (Bunyak, Ferrin, Heavner, Maniero, Mitchell, Morse, Porter, Vimont)

Air Resource Management Training: The AQD, in conjunction with the WASO Training Division, held a 5-day Air Resource Management for Resource Managers class January 25-29. The course provided the trainees with information on adverse air pollution effects on resources, and the regulatory framework within which resource managers can work to protect these resources. (Breitenfeld, Scruggs)

PERMIT REVIEW AND TECHNICAL SUPPORT

During January the Policy, Planning, and Permit Review Branch reviewed permit applications for the new air pollution sources listed in Table 1 which are proposed near NPS/FWS areas. Please contact the staff person identified for more specific information regarding these projects.

GASEOUS POLLUTANT MONITORING

Annual Data Summary Reports: 1991 annual gaseous pollutant summary reports have been prepared for Voyageurs National Park, Yellowstone National Park, and the Camp Mather and Wawona Valley sites at Yosemite National Park. Final ozone, sulfur dioxide and/or meteorological data are included, as well as graphs and summaries of the data. These reports were sent to the parks and the respective regional air quality coordinators.

Calibration and Maintenance Visits: Tables 2 and 3 list the semi-annual calibration and maintenance visits conducted during January 1993 and those to be performed February through May 1993. Visits will be scheduled with the site operators by the visitor. Site operators, park superintendents and regional air quality coordinators will be given a 2-week written notice of the site visit. (Ron Lawler Heavner)

NAAQS Exceedances: The raw data for January 1993 indicated that all NPS areas with monitoring sites were below the ozone and sulfur dioxide NAAQS during January. (Ron Lawler Heavner)

BIOLOGICAL EFFECTS PROGRAM

Archiving of Saguaro National Monument Reports: The Biological Effects Program submitted a number of reports and related material resulting from AQD-funded research at Saguaro National Monument (NM) to the Denver Service Center Technical Information Center/Project Information File (TIC/PIF) for archiving. Saguaro NM information now archived at the TIC/PIF includes final reports on studies investigating air-pollution effects on lichens, conifers, and saguaro cacti, in addition to a number of saguaro plot maps. Information is stored in hard copy and on microfiche at the TIC/PIF, and can be checked out from them onsite. In addition, the TIC/PIF will mail copies of reports to anyone who requests them for a nominal xeroxing fee. Items can be ordered directly from the TIC/PIF at (303) 969-2130. The Biological Effects Program plans to archive all future reports resulting from AQD-funded research in a similar manner. (Maniero)

Dr. William Hogsett visits AQD: Dr. Hogsett (EPA-Corvallis, OR) spent 2 days with the AQD on January 26-27. He participated in the

Air Resource Management For Resource Managers Training Course, where he provided an overview of "Air Pollution Effects on Vegetation and EPA's Role in its Protection." Dr. Hogsett summarized his own research project, "Criteria Air Pollutants, Ecological Effects Research," during an informal meeting with members of AQD and the FWS. He also met with individuals and groups from each of AQD's three branches to discuss subjects of mutual concern and areas for cooperation and joint research. Dr. Hogsett's group at the EPA will be preparing the criteria document to support a change in the secondary National Ambient Air Quality Standard for ozone to protect crops and native vegetation in time for the next review of the standard in 1995. (Nash, Tonnessen)

AQD Division Seminar Presented by Research Division Staff: On January 19, Randy Ferrin, Biological Effects Program, presented a seminar at the monthly AQD meeting. His talk was entitled "The Air Resources Program of the White Mountain National Forest (WMNF)." In his presentation, Randy described the establishment of the air resources program on the WMNF and the identification of AQRVs for two Class I areas. He also discussed the AQRV monitoring and inventory program which included visual range, water quality, and meteorology, as well as several cooperative studies with other organizations. These cooperative studies included fine particle monitoring, ozone monitoring at high and low elevations, and an ozone effects study. The effects study incorporated passive and mechanical ozone monitors, growth chambers, and numerous field plots to examine the effects of ozone on native vegetation. The study was done through a cooperative effort between the WMNF, USFS, State and Private Forestry, and the University of Massachusetts. The Appalachian Mountain Club Research Department was involved in the fine particle and high elevation ozone monitoring through challenge-cost share agreements. He concluded the seminar with a brief summary of the data from the past 8 years. (Ferrin)

Discussion of Air Quality Studies at Theodore Roosevelt National Park (THRO): On January 4, Roger Andrascik, Resource Manager, THRO, and Janet Wise, AQC Rocky Mountain Region, met with AQD staff members Kathy Tonnessen, Tonnie Maniero, John Bunyak, and Randy Ferrin, and Ellen Porter, USFWS. The meeting was called to discuss the possibilities of requesting certain permit requirements for the Dakota Gasification Company's PSD permit for their Great Plains Synfuels Plant. This was a follow-up to the NPS Federal Register notice, which suggested that the applicant fund post-construction monitoring of the possible effects of emissions on sensitive receptors in the park. Discussion centered on what was currently known about sensitive receptors, ambient air quality, and deposition rates at the park, and what information was needed to better predict effects. We developed a list of potential studies and monitoring efforts at the park. These included, by priority: 1) establish an NDDN site; 2) establish an IMPROVE site; 3) conduct sulfur isotope work on sources and receptors; 4) conduct low level dose response work on selected receptors; 5) perform fumigation work on species which have not been rated as to sensitivity; 6) revisit permanent lichen and bryophyte plots at THRO and evaluate the most abundant species; 7) conduct evaluation on the rare lichen species Usnea and Bryoria; 8) conduct physiological studies of common THRO species subjected to fumigation; 9) conduct a literature search on the effects of SO_2 on the eight plant species that are State listed and the three candidate butterfly species. This list accompanied our response to the State of North Dakota. (Ferrin)

AQD Staff Meets with the Colorado AQRV Committee: The Colorado AQRV Committee met on January 25 in Lakewood, Colorado. In attendance were: Dan Ely and Colleen

Campbell, Colorado Department of Health; John Turk, U.S. Geological Survey (USGS); Dennis Haddow, USFS; Ellen Porter, USFWS; Tonnie Maniero, Brian Mitchell, and Randy Ferrin, NPS-AQD. We discussed several topics including a summary by Ely, Haddow, and Mitchell of their work with the Grand Canyon Visibility Transport Commission. This was followed by a discussion of the Mt. Zirkel Wilderness Area (USFS) issue, where there is strong evidence that visibility and aquatic resources are being affected by coal-fired power plant emissions. Haddow and Ely discussed their strategies to keep the media, the public, Public Service Company (operator of two power plants upwind), and other interested parties informed and involved in this issue. Mitchell discussed the possible redesignation of Dinosaur National Monument to Class I status at the request of the superintendent. Ely outlined what would be required to initiate this process. Maniero and Ferrin briefed the group on NPS efforts to formalize AQRVs for the NPS Class I areas. Campbell described her efforts at quantifying the acreage of and fuel volume and emissions from prescribed fires in Colorado. Porter mentioned the move of the USFWS air resources program into their Washington Office. Turk described USGS' attempts at quantifying acidic deposition in Rocky Mountain snowpacks and their plans to sample snow this spring. One of their long-term interests is to examine episodic acidification of low-order, high-elevation streams, and its effects on stream biota. Turk will provide more detail in a seminar to be given on February 10 at the AQD office. (Ferrin, Maniero, Mitchell, Porter)

AQD Staff Publications: A journal article co-authored by Bruce Nash and colleagues at Penn State University, "ForestHealth, an expert advisory system for assessing foliar injury and crown health of selected northern hardwoods," was published in the Canadian Journal of Forest Research (22:1770-1775, 1992). This article describes the development of a quality-assurance method for training and testing field observers. Kathy Tonnessen is a co-author with Mark Williams (University of Colorado), John Melack (University of California) and Yang Daqing (Lanzhou Institute of Glaciology, China) of an article in Annual of Glaciology (16: 25-32, 1992) on "Sources and spatial variation of the chemical composition of snow in the Tien Shan, China." These data were collected during a field investigation in Xinjiang Province, China, in May 1990. (Nash, Tonnessen)

USGS Open File Report on Wrangell-St.Elias National Park and Preserve (WRST) Available: Researchers from the USGS, Geochemistry Branch, worked with NPS staff at WRST to collect and analyze vegetation and soil samples to determine concentrations of elements. This assessment was initiated because of plans by the Department of Defense to build a coal-fired power plant to support radar operations adjacent to the park. Because of a change in plans the plant will not be operated. The data collected at the park are available in a USGS Open-File report No. 93-14, "Element Concentrations and Baselines for Moss, Lichen, Spruce, and Surface Soils, in and near Wrangell-Saint Elias National Park and Preserve, Alaska." Please contact the Research Branch if you want a copy of the report. (Tonnessen)

Research Division Staff Presents Science/Policy Information at University of Colorado, Boulder: Kathy Tonnessen presented a seminar at the weekly colloquium of the Department of Geography at University of Colorado, Boulder, on Friday, January 22. She discussed the data base generated at Shenandoah National Park (SHEN) on the effects of acid deposition on aquatic resources, and the use of those data in the policy process. There was a general discussion with students and faculty on the need to quantify the effects on resources of point source emissions of nitrogen and sulfur oxides in Class I areas. (Tonnessen)

DIVISION

January Division Meeting: Sally Small from the Denver Service Center's Eastern Team spoke at our January division meeting about her electric car. She discussed cost, operation, maintenance, etc. We appreciate her taking time to share her personal experience in pollution control with us. (Diedrichs)

TABLE 1

PROJECT	LOCATION	MAJOR COMMENTS	CONTACT
Healy Clean Coal Power Project (50 MW coal-fired boiler)	6 km N of DENA	Major source of SO_2, NO_x, and CO; significant emitter of PM. Visibility analyses indicate adverse impacts at DENA; FLM recommended the State deny the air quality permit.	Rolofson
SEI Birchwood (220 MW, coal-fired power plant)	92 km E of SHEN	Major SO_2 and NO_x source; Well controlled plant (SCR for NO_x control and 94% efficient scrubbers for SO_2 control); nevertheless, FLM determined that emission increases would contribute to adverse impacts at SHEN; recommended State not issue permit unless source obtains sufficient emission offsets.	Bunyak
Dakota Gasification (coal gasification plant)	120 km E of THRO; 150 km SE of the Lostwood Wilderness Area	Major reductions in "actual" SO_2, NO_x, and PM emissions, but increases in "permitted" SO_2 and NO_x emissions; project would significantly contribute to increment exceedances at both the park and refuge; therefore, applicant requested FLM to certify no adverse impacts; considering major reductions in actual emissions, we agreed no adverse impacts, but recommended State require post-construction monitoring/studies to obtain more information.	Bunyak
Central Florida Power (oil/gas fired cogeneration plant, 206 MW)	120 km SE of Chassahowitzka Wilderness Area	Major NO_x and CO source; no significant impacts expected at the wilderness area.	Maniero
Holnam Inc. (cement plant modification)	40 km NW of Noxubee National Wildlife Refuge	Very large existing source of SO_2, but no proposed increase in SO_2 emissions; minor increases in other pollutants; no significant impacts expected at the refuge.	Porter

TABLE 2

SITE LOCATION	VISITED BY	DATE
Grand Canyon NP	Mark Tigges (ARS)	January 5-7
Canyonlands NP	Ron Lawler Heavner (AQD)	January 12
Sequoia NP	Mitch Walker (ARS)	January 12-14
Yosemite NP (Camp Mather)	Mitch Walker (ARS)	January 15
Canyonlands NP	Mike Bagby (ARS)	January 19-22
Olympic NP	Robert Lehman (ARS)	January 26-28
Mount Rainier Np	Robert Lehman (ARS)	January 29-February 1

TABLE 3

SITE LOCATION	TO BE VISITED BY	DATE
February Site Visits		
Everglades NP	John Faust (ARS)	February 8-11
Lassen Volcanic NP	Mark Tigges (ARS)	February 11-12
Hawaii Volcanoes NP	John Faust (ARS)	February 24-27
Haleakala NP	John Faust (ARS)	February 22-23
March Site Visits		
Mesa Verde NP	Mike Bagby (ARS)	March 1-5
Acadia NP	Mitch Walker (ARS)	March 8-11
Rocky Mountain NP	Robert Lehman (ARS)	March 16-17
Shenandoah NP	Mitch Walker (ARS)	March 22-26
April Site Visits		
Big Bend NP	Mark Tigges (ARS)	April 5-7
Craters of the Moon NM	Mike Bagby (ARS)	April 12-14
Great Smoky Mtns. NP	John Faust and Mitch Walker (ARS)	April 19-26
Indiana Dunes NL	Robert Lehman (ARS)	April 26-29
May Site Visits		
Joshua Tree NM	Mark Tigges (ARS)	May 5-7
Denali NP and Pres.	Mitch Walker (ARS)	May 12-14
Yosemite NP	Robert Lehman (ARS)	May 19-23
Yellowstone NP	John Faust (ARS)	May 19-21

THE NRC (NAS) REGIONAL HAZE REPORT

As steward for some of this nation's most spectacular scenic resources, the National Park Service welcomes the report on "Protecting Visibility in National Parks and Wilderness Areas" by the National Research Council (NRC) of the National Academy of Sciences. The NRC report reminds us that visibility -- "the ability to look out over great vistas to see shapes and colors with crystalline clarity" -- is "at the heart" of the park and wilderness experience throughout the United States. The NRC's report also alerts us to the fragility of the visibility resource as well as its seriously damaged state. For example, the average annual visual range in the West is about one-half to two-thirds of natural visual range, and the average annual visual range in the East is only one-fifth of natural. Episodes, of course, can be worse.

The NRC report shows that "visibility impairment is probably better understood and more easily measured than any other air pollution effect." For example, the pollutants that cause impairment are largely known. The NRC report reviews the two programs established by the 1977 Clean Air Act Amendments specifically to address visibility in certain national park and wilderness areas, and finds that substantial implementation has not occurred for various reasons. With respect to regional haze in particular, i.e., that form of visibility impairment that is by far most prevalent and destructive, the NRC report notes the absence of a regulatory program "despite major advances in monitoring techniques, regional scale models, and scientific knowledge . . .." The NRC report also finds that emission control programs already adopted or planned, including the acid rain control program mandated by the 1990 Clean Air Act Amendments, "will not solve the nation's visibility problem." In fact, despite the 1990 amendments, the sulfur dioxide emissions that are a major cause of visibility impairment are projected to increase in the West, where the visibility resource is particularly valuable and vulnerable.

The NRC Report makes several constructive recommendations, including the following:

- To make progress toward the Clean Air Act's visibility protection goal "will require regional programs that operate over large geographic areas and limit emissions of pollutants that can cause regional haze."

- These programs should "consider many sources simultaneously on a regional basis." Although determining the contribution of individual sources may be helpful in certain circumstances (such as assessing the impacts of a proposed major new source), the NRC report warns against relying more heavily on programs focused on determining individual source contributions. Such programs are "extremely time-consuming and expensive" and subject to "considerable uncertainties."

- Scientific models to design the regional visibility programs "are available today."

- Important differences between the visibility problem in the West and in the East may necessitate different approaches.

- Efforts to improve visibility in national parks and wilderness areas will also improve visibility in other areas. Such efforts could also help reduce certain air pollution effects on human health and the environment caused by the same pollutants.

- Protecting visibility will require a "substantial, long-term program."

In a critical conclusion, the NRC report finds that "current scientific knowledge is adequate and control technologies are available for taking regulatory action to improve and protect visibility." The NRC report makes several recommendations for additional research, while warning that such research is not a pre-requisite to the recommended regulatory program.