

WRAP Region BART Status (March 27, 2009)

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Alaska BART

Alaska initially looked at 7 facilities for BART applicability, but eliminated one from further consideration late in 2007 (Chugach Beluga Power Plant) after they determined that the plant units were single-cycle during the BART timeframe, but reconstructed to combined cycle after the 1977 BART cutoff date.

Alaska requested that the WRAP aid them in conducting the initial “Subject to BART” modeling. The WRAP’s Regional Modeling Center evaluation completed in April, 2007, showed all 7 facilities showing visibility impacts of 0.5 dV or more. In addition to the Chugach Beluga plant, the other six included the Alyeska Marine Pipeline Terminal near Valdez on Prince William Sound, the Golden Valley Electric Association (GVEA) Healy Power Plant located east of Denali National Park near Fairbanks, and 4 facilities located on the Cook Inlet near Anchorage. These Cook Inlet sources include the Agrium Nitrogen Operations/Urea Plant, the Conoco-Phillips Kenai Liquefied Natural Gas (LNG) Plant and the Tesoro Petroleum Refinery on the east shore of the Cook Inlet, and the Municipal Light & Power Sullivan facility in Anchorage.

Alaska waited through most of 2007 to get their BART Regulations in place, with these finalized in November ‘07. They then sent official BART determination letters to these remaining 6 BART eligible facilities between the end of ‘07 and shortly after the new year in 2008. They eventually determined that the **Alyeska Terminal** was not “Subject to BART”, as additional modeling conducted by the company lowered the visibility impact below the 0.5 dV threshold. The other 4 BART eligible facilities were notified that re “Subject to BART”.

The **Anchorage ML&P Sullivan Plant** has three dual fuel fired (gas/diesel) turbine generators, only two of which were constructed (ie/ permitted) during the BART window prior to 1977. These are the 480 MM Btu/hr GTG-5 unit and the 1,093 MM Btu/hr GTG-7 unit. And there were 11 units at the **Tesoro Petroleum Refinery** constructed during the BART window, that were BART eligible. These two facilities remodeled their potential visibility impact, and per Alice Edwards’ 9/30/08 Email confirmed that both of these facilities did modeled out of BART applicability.

There was some controversy about whether the **Conoco-Phillips Kenai LNG Plant** (having compressor, boiler & heater equipment) was a “fuel conversion plant” under the 26 Source Categories in the BART regulation, but the Alaska Attorney General’s office ruled that it was BART eligible. Alaska received an exemption modeling package from Conoco-Phillips, but that modeling still showed Class I impacts over 0.5 dV. Therefore on May 14, 2008, they officially notified this company that the Kenai LN Plant is “Subject to BART”. As of September ‘08 this facility had requested a permit limit reduction allowing it to escape BART. As of January ‘09, Alaska reported that BART controls were anticipated for the Kenai Plant and Alaska was still working on this Owner Requested Limit (ORL).

Regarding **GVEA**, this plant has one 327 MM Btu/hr sized coal fired unit (around 26 MW - uncontrolled for NO_x and SO₂; 12 module baghouse for PM control) that is “Subject to BART, along with some small auxiliary heaters and diesel generators. There is a newer 1996 installed (post BART) 658 MM Btu/hr sized unit that is well controlled with Low NO_x burners, a Spray Drier scrubber and a Fabric Filter baghouse. This plant is located immediately adjacent to the Denali Class I area.

The **Agrium Urea Plant** consists of about 50 small heaters, boilers and miscellaneous process vents. This facility was closing for lack of natural gas feedstock, but was planning a coal gasification addition to provide an alternative source of plant feed in the future.

DEQ received BART permit applications for GVEA and Agrium prior to September ‘08, and the latest information was that these two permits were under review and Alaska had requesting follow up information from the sources. There is on going dialogue with the sources on these BART evaluations. Once the issues are resolved, if the regulatory time frame for submitting, reviewing and meeting public notice requirements is fully used, Alaska anticipates that the BART determinations would be made prior to the end of 2009.

Arizona BART

Arizona initially had 13 BART eligible facilities, and they requested that the WRAP aid them in conducting the initial “Subject to BART” modeling. The WRAP’s Regional Modeling Center completed that evaluation in May 2007, with 9 facilities showing visibility impacts of 0.5 dV or more. They included 5 non-utilities: the Abitibi Snowflake Pulp Mill, the Arizona Portland Cement Plant at Phoenix, the Chemical Lime Company’s Nelson Lime Plant, and two copper smelters; (Asarco Hayden & Phelps Dodge Miami). The remaining 4 include one gas fired (Arizona Public Service’s [APS] West Phoenix) and three coal fired power plants (APS Cholla plant, the Arizona Electric Power Coop (AEPSCO) Apache plant, and the Salt River Project [SRP] Coronado Plant).

Arizona sent letters to these 9 facilities in July ‘07 that they were “potentially” subject to BART, Five were negotiating with Arizona DEQ to try to get out of BART requirements. The two copper smelters (**Hayden & Miami**) have put forth the argument that because they went through a MACT review by EPA recently, they already have state-of-the-art emission control and no more reductions are to be gained through BART. **Chemical Lime Nelson** was redoing their “Subject” modeling with different emission factors in hopes of demonstrating that they don’t trigger the 0.5 dV threshold, while **Arizona Portland Cement** is relying on a facility modification permit which will eliminate the pieces of equipment that were “Subject” from the future plant configuration. And **APS West Phoenix** is also arguing that they are not truly a BART source as their modeling emissions were based on oil burning which is no longer part of the operating scheme for these originally dual fueled units .

Four of the 9 “potential” facilities agreed with that they were subject to BART. The Abitibi pulp mill, the AEPSCO Apache and the APS Cholla power plant submitted BART applications in January ‘08. The engineering control analysis for the SRP Coronado Plant was submitted shortly

after that. Because Coronado was under sanction for NSR violations with EPA, their application was intended to take care of both the NSR issues and satisfy BART.

Arizona is currently in review of these BART applications and is unable to pin down timing for review completion and date for final BART determinations. But given the complexity of the issues, and some staffing/resource questions within ADEQ, along with Public Notice and hearing time, the actual issuance of the BART permits will be pushed back into late 2009.

California BART

California BART effort was somewhat more complicated than most other states because there the State Air Resources Board was not directly in charge of stationary point sources. Rather California has 35 separate Air Quality Management Districts which have regulatory authority over these point sources, leaving CARB to work through these Districts for identifying and evaluating BART sources to include in the California RH SIP.

California initially had over 400 possible BART sources, but winnowed that list down to 39 BART eligible facilities. Of these BART eligible sources, California determined that 13 should never have been named because it was eventually determined that these didn't really meet all three of the BART eligibility criteria (age, emissions or category).

Of the 39 BART eligible facilities, CARB modeling showed that some did not have the 0.5 dV threshold impact on a Class I area, so were not "Subject to BART". And California has determined that existing control equipment at a number of these facilities is already at or exceeding BART level control efficiencies. This is especially true in the South Coast District where the RECLAIM (Regional Clean Air Incentives Market) Cap & Trade Program mandates annual reductions in SO₂ and NO_x.

Of those remaining BART eligible facilities Reliant Energy Coolwater Plant at Daggett and the Big West @ Bakersfield were remodeled with revised stack parameters to determine Class I visibility impact. Both were determined to have less than 0.5 dV visibility impact, thus are not to be "Subject to BART". The Conoco-Phillips Rodeo Plant, Chevron, Martinez Refining [Shell] and Tesoro Refineries were eventually also exempted from BART. The **Valero Refinery at Benicia** was the only facility for which BART controls were mandated under the California RH SIP. California held a hearing and adopted their RH SIP on January 22, 2009. Final BART provisions for Valero are to be released shortly.

Colorado BART

Colorado law requires that their Regional Haze SIP be approved by their legislature, thus they had to begin work on their RH plans a year earlier than everyone else in order to get a document drafted for review during the 2007 Legislative Session, prior to the December '07 SIP submittal deadline. They completed that Draft SIP and it was approved by the Colorado Air Quality Commission December 17, 2007, with a couple of exceptions. The revised SIP (with Commission exceptions) was approved by the Colorado Legislature during their Spring '08

session. The Colorado SIP and Appendices (Appendix A contains the BART determinations) are available at:

<http://www.cdphe.state.co.us/ap/regionalhaze.html>

To begin the BART process, Colorado Air Pollution Control Division held a Stakeholder outreach which involved most BART sources in the state, and they passed a BART rule in March '06, which was modeled after the July '05 EPA rule. They adopted the 0.5 dV visibility impairment contribution threshold from EPA guidance, for SO₂, NO_x and PM, but excluded VOC as not significant in visibility impact.

There were originally 13 BART eligible facilities in Colorado, but the Subject to BART modeling reduced that to 9 facilities. These are composed of 1 cement plant, twelve individual EGU units at 7 different plant sites, and two industrial boilers at the Coors Brewery (CENC - Colorado Energy Nation Company). Colorado APCD received BART control Permit Applications from these 9 facilities in July and August '07, and drafted BART control proposals which were included in the December '07 SIP package.

Because of space limitations, the two CENC boilers were exempted from SO₂ controls because there was no place to physically locate scrubbers.

At one EGU facility there was concern that Colorado sub-bituminous coal had a higher nitrogen content than other sub-bituminous coals. That was resolved with the source agreeing to obtain alternative coal. And the 2007 Colorado Legislature passed a state law that post-combustion NO_x controls were NOT to be considered, even though presumptive limits are mandated for 750 MW power plants. There was only one such 750 MW facility in the state (Tri-State Craig Plant), and the BART plan accepted combustion controls there (0.30 lb/MM Btu annual average), even though presumptive levels will not be met. Low NO_x burners and Overfire Air are the combustion controls considered at Colorado EGU's.

The EGU's considered lime spray driers for SO₂ control, as Colorado determined that these driers have approximately as good a control performance as wet scrubbers. SO₂ limits were set between 0.10 & 0.13 lb/MM Btu. All the plants had baghouses for PM control, and Colorado accepted that performance at 0.03 lb/MM Btu.

Colorado accepted one Alternative Plan which "bubbled" the SO₂ emissions from three metro-Denver plants under a 10,500 TPY cap. Two of the facilities had "Subject" units (Valmont & Cherokee), while the third non-BART facility (Arapaho) retired two units and accepted controls on two more to bring emissions down from 25,000 tons previously. The 10,500 ton cap was lower than would have been achieved if BART had been applied only to the "Subject" units.

Overall, the Colorado retrofit plan achieves a statewide SO₂ emission reduction of about 17,000 TPY by implementing BART, with NO_x reductions in the range of 7,000 - 10,000 tons. But there were two exceptions to the Commission 2007 approval of the SIP BART plan: Cemex Lyons Cement Plant and the Colorado Springs Martin Drake EGU.

The Cemex plant was the only Colorado "Subject to BART" source that was not a coal fired power plant, and Colorado APCD originally proposed to hold that cement plant to a 20% reduction in NO_x with combustion controls only. They accepted process control of SO₂ as the alkali cement absorbs the acidic sulfur, while PM emission limits were set at 0.3 lb/Ton on the kiln and 0.1 lb/ton on the Clinker Cooler. But the Commission determined that post-combustion NO_x control should be considered at this facility, and approved a revision to Colorado "Regulation 3" which limited prohibition of post-combustion controls solely to boilers. Thus the BART decision was remanded back to Colorado APCD for additional review. Colorado reviewed the original BART application, and made a BART proposal to use Selective Non-Catalytic Reduction (SNCR @ 268pph NO_x) at Cemex in their December 2008 SIP revision.

The Colorado Martin Drake EGU had proposed control measures that brought emissions down below a threshold which allowed it to "model out" of contributing to visibility impairment (below 0.5 dV impact). But the Colorado Commission remanded that proposal back to Colorado APCD and required a full BART analysis. Colorado also reviewed the original BART application, and proposed lime spray driers (0.15 lb/MM Btu SO₂ Units 6&7; no control 1.2 lb/MM Btu Unit 5) and overfire air (0.35 lb/MM Btu NO_x) for the Drake plant in their December 2008 SIP revision.

These revised proposals for Cemex & Martin Drake were approved by the Colorado Commission at their December hearing.

Idaho BART

Idaho began their BART work by looking at the 11 facilities that were identified by the WRAP contractor as potentially BART eligible. Upon internal state review, they dropped three facilities as either falling outside the dates of the 1962-77 BART window, or having less than 250 TPY of potential emissions.

With the exception of Monsanto/P4 Soda Springs plant, the other facilities were modeled by the State of Idaho in 2005 to determine whether they were "Subject to BART". Idaho is partners with the States of Oregon and Washington in a Northwest Modeling group, which jointly developed BART Modeling protocol used for this evaluation. The initial modeling report came out in 2006 showing that three facilities had at least 0.5 dV impact on one or more Class I areas, thus were "Subject to BART". The BART eligible equipment involved a coal fired industrial boiler at each of three TASCOS (The Amalgamated Sugar Co) sugar beet processing plants located in Nampa, Twin Falls and Paul, Idaho.

These three TASCOS facilities were remodeled once with revised emission data, which didn't change the initial conclusions. But a second modeling run with revised meteorological data did show reduced impact below 0.5 dV BART guideline threshold, and left just one plant (Nampa) Subject to BART. Results showed Nampa "contributing" to visibility impairment at Hell's Canyon, Eagle Cap and Strawberry Mountain Wilderness areas, with a maximum impact of 1.3 dV at Eagle Cap.

In January '07 Idaho gave TASC0 some BART control guidance, including a list of control technology options generated by the Midwest RPO. The company submitted a list of BART control options at the end of April '07, which Idaho DEQ evaluated for appropriate BART level controls. These BART level emissions were used to feed a final modeling demonstration of achievable visibility improvement levels.

Idaho DEQ set target modeled BART level visibility dV levels and intended to allow TASC0 to meet those visibility targets with an operating scheme producing equivalent emission reductions. The TASC0 BART proposal was received February 6, 2009, but in that proposal they are claiming financial hardship in which installation of the technically feasible control alternative would require two years of net profits just to cover the capitol cost of the equipment. Idaho's next step is to consult with FLM's and EPA to confirm wither the information supplied by TASC0 is sufficient to warrant a lower control proposal. Idaho is still targeting a final determination sometime in 2009.

As noted above, one Idaho BART eligible facility, the Monsanto/P4 plant at Soda Springs, did not go through "Subject to BART" modeling. That was because the company preempted the modeling review with a permit modification application. Monsanto requested that Idaho review a plan for installing emission reduction equipment to determine if that equipment met BART control objectives. The proposal involved installation of a scrubber system for the off gases from the coal fired phosphate kilns at the plant which would reduce SO₂ emissions about 95% from around 13,000 TPY, down to near 600 TPY. And the Monsanto plan also included an alternative scheme that would eliminate use of a thermal oxidizer for continued operation of the plant during sequential maintenance of the plant kilns. The company had determined that this thermal oxidizer was too expensive to run during such maintenance periods, so they planned to shut the entire plant down for annual maintenance of all the kilns at once. This eliminates the approximately 1,600 annual tons of NO_x generated by the thermal oxidizer. Idaho put this permit proposal out to Public Notice in mid-summer, and was expecting to issue this revised Monsanto permit by the end of 2008. But the company is still negotiating on whether all of these control measurers are necessary, and thus the permit is currently on hold.

Montana BART

In June '06 Montana made the decision to pull out of Regional Haze implementation efforts and turn the program back to the EPA. Montana initially had 10 facilities determined to be BART-eligible. EPA began review of these sources in early 2007, and eventually determined that the Asarco Helena Lead Smelter was shut down, and requires a new NSR BACT permit to resume operation and effectively removing it from the list of BART Eligible sources for the state. EPA requested that the WRAP aid them in conducting the "Subject to BART" modeling for the remaining nine BART eligible sources, and the WRAP's Regional Modeling Center completed that evaluation in May 2007. Results showed that BART eligible units at four plants (the Cenex Laurel and Exxon Billings oil refineries, the Smurfit Stone Missoula pulp & paper operation, and Montana Sulfur in Billings) **did NOT** contribute to visibility degradation with no impacts greater than 0.5 dV. Modeling showed that the remaining five facilities; **Ashgrove** and **Holcim cement plants**, the **Columbia Falls Aluminum Works**, and **two PP&L coal fired power plants**

(Corette & Colstrip), did exceed the 0.5dV threshold, and thus were determined to be “**Subject to BART**”.

EPA has received BART control analyses from the five sources, with these applications posted on the EPA Region 8 website at:

<http://www.epa.gov/region8/air/mtregionalhaze.html>

Applications for the two cement plants and the two PP&L coal power plants were submitted over the summer of 2007 (June-August), while the Columbia Falls plant application was submitted in November '07. Review of the PP&L facilities shows that the Corette plant has one 154 MW sized boiler Subject to BART. At Colstrip only two of the four units are Subject to BART (Units 1 & 2 @ 307 MW each [approximately. 4,000 MM Btu/hr firing rate]). The Corette Unit has an electrostatic precipitator for PM control, Low NO_x burners with overfire air and is unscrubbed. The two Colstrip units have venturi wet scrubbers for both PM and SO₂ control, and Low NO_x burners with overfire air. Existing allowable emission rates and Presumptive BART emission guidelines are as follows:

Facility	Pollutant Allowable Emission Rates (lb/MM Btu)		
	PM	SO ₂	NO _x
J.E. Corette Plant	0.26	1.00	0.40
Colstrip Units 1 & 2	0.10	1.20	0.45
<i>Presumptive Levels</i>	<i>n/a</i>	<i>0.15</i>	<i>0.15</i>

The PP&L applications suggest that because additional control results in small improvements in visibility impact, they propose to maintain existing allowable emission limits as representing BART for all units.

EPA sent comment letters back to four of the five Montana “Subject” sources in early 2008, and received responses back to their questions in the May-June '08 timeframe. EPA is reviewing those responses and expected internal decisions on BART control preferences by the end of 2008. EPA will have to prepare other elements of the Montana RH FIP such as Long Term Strategy and Reasonable Progress, in addition to the BART determinations, and will likely go out to Public Notice with all of these FIP elements at the same time. It is expected that preparation of this FIP will consume most of 2009, and the FIP will not be finalized until sometime in 2010.

Nevada BART

Nevada began their BART work by looking at 7 BART eligible facilities within the state, and they requested help from the WRAP’s Regional Modeling Center in conducting the initial “Subject to BART” modeling. The RMC completed that evaluation in May 2007, with two

facilities dropping off Nevada’s list (visibility impacts came in below 0.5 dV for the Chemical Lime Apex plant and the Nevada Power Sunrise facility). Two facilities weren’t modeled as the Nevada Air Quality Bureau was in the middle of discussions at the time regarding the status of the two Nevada Cement Fernley plant cement kilns and the Southern California Edison (SCE) Mohave coal fired power plant. The RMC modeling did show visibility impacts of 0.5 dV or more for three Sierra Pacific Power Company (SPPC) affiliates: thus the **SPPC Tracy** and **Ft. Churchill** dual fuel gas/oil fired power plants and the SPPC subsidiary Nevada Power Company’s **Reid Gardner** coal fired power plant were determined to be “Subject to BART”.

Nevada Cement subsequently decided to conduct their own BART modeling using some revised meteorological data and submitted those results in early 2008. The Nevada Air Quality Bureau reviewed these results and concluded that the modeling does exempt the Fernley plant from further BART evaluation.

The state Environmental Commission held a hearing in November ‘08 on Nevada’s BART Regulation, where they considered the Air Quality Bureau’s proposed allowable emission rates for the four plants as follows:

Facility	Unit	Proposed Pollutant Allowable Emission Rates (lb/MM Btu)		
		PM	SO ₂	NO _x
SPPC Ft. Churchill <i>(Firing Natural Gas or #2 Fuel Oil Only)</i>	1	0.030	0.05	0.20
	2	0.030	0.05	0.16
SPPC Tracy <i>(Firing Natural Gas or #2 Fuel Oil Only)</i>	1	0.030	0.05	0.15
	2	0.030	0.05	0.12
	3	0.030	0.05	0.19
Nevada Power Reid Gardner	1	0.015	0.40	0.20
	2	0.015	0.40	0.20
	3	0.015	0.40	0.28
SCE Mohave <i>(Firing Natural Gas Only)</i>	1	0.0077	0.0019	0.15
	2	0.0077	0.0019	0.15

The SPPC Ft. Churchill plant has twin 113 MW units. The state BART proposal would restrict these units to firing pipeline quality natural gas or #2 fuel oil only for PM and SO₂ control. For NO_x the BART proposal requires installation of Low NO_x burners with flue gas recirculation.

The SPPC Tracy plant has three boilers of 55 MW, 83 MW and 113 MW, respectively. Identical to plans for Ft. Churchill, the state BART proposal at Tracy would restrict these units to firing pipeline quality natural gas or #2 fuel oil only for PM and SO₂ control. For NO_x the BART proposal requires use of Low NO_x burners with flue gas recirculation on Units 1 & 2, with of Low NO_x burners and selective non-catalytic reduction (SNCR) on Unit 3.

The Nevada Power Reid Gardner plant has three identical 100 MW size coal fired boilers, which currently have Low NO_x burners, wet soda ash FGD scrubbers and mechanical collectors for particulate control. The NO_x BART proposal at this plant includes adding rotating opposed fire air (ROFA) and “Rotamix” ammonia injection to the existing Low NO_x burners. They would keep the existing wet scrubbers and would add a fabric filter baghouses to replace the mechanical collectors.

Although not currently operating the SCE Mohave plant is under a Consent Decree. The control technology proposal would meet both the terms of the Consent Decree and satisfy BART. The plant has two twin 790 MW coal fired boilers. The control proposal restricts the units to firing pipeline quality natural gas only for PM and SO₂ control and upgrades to Low NO_x burners with overfire air for NO_x control.

Nevada did receive final comments on their BART proposals in March, and anticipates finalizing their SIP with BART provisions by May '09.

New Mexico BART

New Mexico requested that the WRAP aid them in conducting the initial “Subject to BART” modeling, and the WRAP’s Regional Modeling Center completed that evaluation of 11 New Mexico BART eligible facilities in May 2007. Results showed that only one plant, the Public Service of New Mexico San Juan Generating Station, was contributing to visibility degradation with at least a 0.5 dV impact. Modeling showed the greatest impact at Mesa Verde and Canyonlands National Parks, although it also “caused” visibility impairment at 14 other Class I areas in the four corners area of Colorado, Utah, Arizona and New Mexico.

The analysis of this plant’s control options was complicated by the fact that San Juan is already installing controls under a May '05 Consent Decree for other violations. That Consent Decree limits NO_x emissions to 0.30 lb/MM Btu (30 day rolling average) using Low NO_x burners, Overfire Air technology and a “Neural Network” combustion optimization system. It also holds San Juan to 0.015 lb/MM Btu particulate to be achieved by replacing the current electrostatic precipitator with a baghouse. The 4 units are already scrubbed for SO₂.

San Juan submitted a BART engineering analysis in June, 2007. The application is available for public review and download from the Appendix O “BART” link on New Mexico’s Regional Haze webpage:

http://www.nmenv.state.nm.us/aqb/reghaz/Regional-Haze_index.html

San Juan is a coal fired power plant with 4 units sized at 350, 360, 544 and 544 MW capacity, respectively for boilers 1-4. The units are dry-bottom, with wall fired burners. This BART analysis focuses control technology for the reduction of NO_x and particulate matter only, because New Mexico is a §309 state and requires the San Juan plant to be part of the WRAP SO₂ Milestone and Backstop Trading program where emissions are controlled by being limited within a regional emission cap.

Regarding NO_x control, the company has proposed that the Consent Decree technology (Low NO_x burners, OFA & NN) is sufficient. They argue that they are not burning Powder River Basin sub-bituminous coal, but rather a coal that is closer to bituminous coal. The “Presumptive Limit” for NO_x on this boiler configuration firing bituminous coal is 0.39 lb/MM Btu, while “Presumptive” for sub-bituminous coal would have been 0.23 lb/MM Btu.

New Mexico is investigating Selective Catalytic Reduction (SCR) on this plant, finding that SCR can achieve approximately 0.07 lb/MM Btu NO_x emissions at a cost factor of about \$6,500 per ton. This lowered emission rate results in approximately a 1.3 dV visibility improvement over the impact modeled at Consent Decree NO_x emission levels, at a total capital cost of approximately \$700 million. This works out to an amortized annual cost of a little over \$97 million per year.

New Mexico is still working on their conclusions for NO_x control options. Once a BART determination is made, it would then have to be incorporated into a Title V permit for San Juan. This Title V Permit revision will not be finalized until sometime late in 2009.

North Dakota BART

North Dakota began early and identified 10 BART eligible sources in 2005. They conducted CALPUFF modeling, which exempted two sources (American Crystal Sugar’s Drayton Plant & the Tesoro Petroleum at Mandan) as having visibility impacts below the 0.5 dV threshold.

In 2006 Montana-Dakota Utilities remodeled their R. M. Hesketh Unit 2 Coal Boiler with refined grid size, speciated PM emissions and annual background visibility. North Dakota reviewed this additional work and agreed May 8, 2007 that Hesketh Unit 2 was not Subject to BART.

This left 4 separate plants with Subject to BART sources: **Basin Electric Leland Olds Station**, **Great River Energy Coal Creek** and **Stanton Stations**, and **Minnkota Power Milton Young Station**. These four sites have 7 individual Subject to BART coal fired EGU’s; 3 being cyclone burners, 2 being tangential fired, while the remaining 2 are wall fired units. North Dakota required submittal of BART applications from these companies, reviewed these applications, and in May ‘08 prepared a Draft BART Implementation plan for EPA and FLM review.

Regarding Filterable PM, all 7 EGU’s were already controlled with electrostatic precipitators operating at 99%+ control efficiency and limited to 0.10 lb/MM Btu performance. North Dakota found that replacement baghouses or precipitator upgrades ran in the neighborhood of \$10,000/ton control costs, and the Air Quality Division didn’t feel that this expense was reasonable for requiring replacement controls. Their proposal lowers allowable limits for 5 of

the 7 EGU's to 0.07 lb/MM Btu, with the other two at the Milton Young Station already being subject to a 0.03 lb/MM Btu emission limit by an EPA/State consent decree for New Source Review violations.

Regarding SO₂, North Dakota lignite coal has varying inlet sulfur content, but three EGU's can also fire Powder River Basin subbituminous coal to bring down the sulfur feed rate. Three of the EGU's had existing wet scrubbers in place (Coal Creek Units 1 & 2 and Milton Young #2), and North Dakota is proposing retrofit installation of either wet or dry scrubbing on the other 4 units. The cost of the new wet scrubbers runs about \$1500/ton, and this was determined to be cost effective for these new installations.

For five of the units North Dakota will set an SO₂ emission limit at the Presumptive Rate of 0.15 lb/MM, with control efficiency at 94 or 95%. The scrubber retrofit at Milton Young #2 will only meet the 95% control requirement without an accompanying lb/MM standard.

Because the smaller 140 MW wall fired unit at Stanton Station is more sensitive to changes in coal type, North Dakota will set separate SO₂ limits by fuel type: 0.24 lb/MM while firing on lignite only and 0.16 lb/MM whenever subbituminous coal is fired (solely or blended). And this Stanton unit will also have to meet 90% control efficiency from its retrofit spray dryer absorber/baghouse SO₂ control system.

NO_x control is more controversial in North Dakota, primarily because of the high sodium content of North Dakota lignite running at least 4% in the ash, up to maximums around 13%. By contrast Wyoming Powder River Basin sub-bituminous coal runs around 1.5% sodium, while Texas lignite is even lower around 0.5% sodium. With this high sodium content the catalyst bed used for SCR tends to deactivate as the sodium fills the reactor pores, and eventually can plug off the catalyst bed entirely. With this technical limitation, North Dakota was considering the use of Selective Non-Catalytic Reduction (SNCR) with Overfire Air as an acceptable alternative at a cost around \$3,000 - \$4,000/ton.

SNCR with overfire air was proposed for the 3 cyclone burners (Leland Olds #2, Milton Young #1 & #2) and for the 2 wall fired units (Leland Olds #1, Stanton #1). For the two tangential fired units at Coal Creek, that company sells flyash for cement manufacture. SNCR tends to produce an ammonia which contaminates the flyash so that it is no longer marketable. Consequently North Dakota was proposing only additional Low NO_x burners and separated overfire air at this site. SNCR achieves emission rates of 0.19 to 0.36 lb/MM Btu, which would be set as a regulatory allowable on each of the five units equipped with this retrofit technology (Leland Olds #1 - 0.19, Leland Olds #2 - 0.35, Milton Young #1 - 0.36, Milton Young #2 - 0.35 ...and... Stanton 0.29 on lignite - 0.24 on subbituminous). The additional Low NO_x burners and separated overfire air at Coal Creek achieves better control performance than SNCR and these two tangential fired units will be limited to 0.17 lb/MM Btu of NO_x.

Overall, North Dakota figures to achieve a statewide SO₂ emission reduction of about 100,000 tons through this BART plan, with NO_x reductions somewhat over 20,000 tons annually.

The NO_x question continues to be discussed between the State of North Dakota, the FLM's & EPA and the ND utility industry, especially regarding the 3 cyclone burners. EPA felt the SCR represents "presumptive level control" for these sources, but the sources challenged that assumption. North Dakota has come to accept that SCR is Technically Feasible on these cyclone boilers, but that leaves the question of whether it is Economically Reasonable. The sources now must gather and report that economic data.

North Dakota now has placed their BART determinations on the same schedule as their overall RH SIP, and expects both to be final prior to the end of 2009.

Oregon BART

Oregon began their BART work by looking at ten facilities, but five eventually modeled out of BART eligibility. Oregon is partners with the States of Idaho and Washington in a Northwest Modeling group, which jointly developed BART Modeling protocol used for "Subject to BART" modeling. Oregon completed their initial review in February '07 and found that three facilities dropped off the list with visibility impacts below 0.5 dV from their BART eligible units (Kingsford Charcoal Briquette and Smurfit Newsprint plants in Springfield, and the Toledo Georgia-Pacific plant). Subsequent remodeling with revised ozone data has shown that both the Boise Cascade St. Helens plant and the Pope & Talbot Halsey plant also fall below the 0.5 dV visibility threshold, thus are exempted from BART.

The remaining two pulp & paper facilities on the list; **Ft. James Wauna mill & International Paper (formerly Weyerhaeuser) Springfield plant** were negotiating with Oregon agencies to adopt enforceable permit reduction limits, which will allow them to model out of BART applicability. The Ft. James permit application came to Oregon DEQ with a plan that decommissioned one of the emission units that made the source subject to BART. Oregon re-ran the modeling without this emission unit, and it appeared that the source will no longer be subject to BART. The permit Public Notice for Ft. James is due out in March '09.

The International Paper plant is in the jurisdiction of the Lane County Regional Air Protection Agency, and that permit application was submitted November 30th, 2007. The permit from that agency went out earlier in the year, and that Public Notice period will end on March 18th.

The eighth non-EGU source in Oregon is **The Amalgamated Sugar Company (TASCO) of Nyssa**, but this plant is currently shut down. Oregon expects that some sort of enforceable permit reduction will be worked out with this sugar manufacturing plant as well, which would remove it from the BART list. But in any case, the Oregon SIP will contain a provision that requires BART evaluation and permitting prior to any future start-up of this plant.

That left Oregon with two Portland General Electric (PGE) power plants remaining on the "Subject to BART" list. The **PGE Beaver plant at Clatskanie** has six natural gas fired turbines, that operate with high sulfur fuel oil as back-up. The Beaver plant submitted an emission reduction permit application (April 3rd, 2008) like the pulp & paper plant did so that it could model out of BART applicability. That permit was issued January 29, 2009 and the reduction will be achieved by use of lower sulfur fuel oil for SO₂ control.

The **PGE Boardman plant** is a 600 MW coal fired utility. Existing controls at Boardman include an electrostatic precipitator for PM, 0.3% low sulfur coal firing for SO₂ minimization and first generation Low NO_x burners. Oregon DEQ went to Public Hearing in December '08 with a BART proposal for this plant. For additional SO₂ control their proposal recommends a “semi-dry” limestone scrubber achieving below Presumptive levels of 0.12 lb/MM Btu. The semi-dry scrubber installation requires the addition of a conventional pulse jet fabric filter baghouse in addition to the ESP to collect the limestone dust, with the combined PM control system achieving a particulate emission rate of 0.012 lb/MM Btu. For NO_x control the BART proposal requires new Low NO_x burners with a modified overfire air system to achieve 0.23 lb/MM Btu. In addition, the proposal requires installation of Selective Catalytic Reduction (SCR) in 2017 for an eventual performance of 0.07 lb/MM Btu, this more stringent control resulting from analysis of Reasonable Progress towards the RH goals.

The Oregon proposed Emission Limits are shown in the following table:

Oregon DEQ Proposed Emission Limits for Boardman Plant

Pollutant	Control	Emission Limit	Averaging Time
BART Phase 1 (2011 to 2014)			
Phase 1 NO _x	NLNB/MOFA	0.28 lb/mmBtu	30 day rolling avg.
		0.23 lb/mmBtu	12 month rolling avg.
SO ₂	SDFGD	0.12 lb/mmBtu	30 day rolling avg.
PM	Pulse jet fabric filter (w/existing ESP)	0.012 lb/mmBtu	3 hour avg.
Phase 2 NO_x Control (2016 to 2018)			
Phase 2 NO _x	SCR	0.07 lb/mmBtu	30 day rolling avg.

The public comment period on this Boardman proposal ran through the end of January '09, with a final recommendation to be made by DEQ Staff to the EQC in June 2009. Oregon held the RH hearing in January '09 and expects adoption of that visibility plan at that same June '09 meeting. Also, 3 of the 4 Federally Enforceable Permit Limits (FEPL's) are expected to be complete in that same June timeframe (with the exception of the currently shut down TASC0 Nyssa plant).

South Dakota BART

South Dakota had 2 BART eligible facilities to look at: the Pete Lien & Sons Rotary Lime Kiln in Rapid City and the Otter Tail Power Company's Big Stone coal fired power plant near Milbank in northeastern South Dakota. South Dakota requested help from the WRAP's Regional Modeling Center in conducting the initial "Subject to BART" modeling. That WRAP modeling for the Pete Lien facility showed visibility impacts below 0.5 dV so South Dakota has determined that it is not Subject to BART. However SD AQD wants to complete their own modeling assessment for independent verification, but is still working on completing this step. The state has not yet issued an official notice on this matter, and does not know exactly when they will formally confirm an exemption determination.

The Big Stone plant has one 450 MW unit capable of firing either sub-bituminous or lignite coal. It is currently operating on Powder River Basin sub-bituminous feed. There are currently no SO₂ controls on this unit, and the burners have only aging excess air controls for NO_x reduction. PM control has gone through an Electrostatic Precipitator, to a hybrid ESP/Baghouse system, and is currently being converted to a Fabric Filter.

Because the nearest Class I area is about 450 KM away the normal Calpuff Modeling is stretched beyond its design range at this distance, the initial positive RMC results on Big Stone were suspect. EPA ran a CAMx/PSAT run on the plant that also showed +0.5 dV threshold impact levels, but the company remodeled with revised stack parameters and emissions in an attempt to gain BART exemption. South Dakota has received the Otter Tail Company modeling and is currently reviewing the revised results. But they want concurrence on the acceptability of the modeling protocol from EPA and the federal land managers, and they are currently awaiting comments from these Federal Agencies before making the final determination on the Big Stone BART “Subject” status.

Another complicating factor is that Otter Tail is also proposing to build a new 600 MW unit at Big Stone, which could affect the BART determination on Unit 1. The proposal includes retrofit low NO_x burners and a FGD scrubber for the existing unit in an attempt to “net out” of PSD requirements. South Dakota does not yet have a good assessment of how long the modeling and the NSR permit review will take, but it expected that the final Big Stone BART determination will be completed sometime in 2009.

Utah BART

There are only two BART-Eligible Sources in Utah; the Pacificorp Hunter & Huntington coal fired power plants. The WRAP Regional Modeling Center was requested to do the “Subject to BART” modeling for these two Utah sources, and completed that work with an April 21, 2007 report which indicated both Pacificorp plants do exceed the 0.5 dV Class I area impact threshold. Pacificorp had already made commitments to meet or exceed presumptive BART limits at these plants under their Mid-America buyout agreement, with installation and/or upgrade of wet-lime FGD’s, baghouses and low-NO_x combustion controls. Utah received these applications and issued permits for legally enforceable limits on the schedule shown below:

Source	Notice of Intent Submitted	Permit Issued	In Service Date
Hunter 1	August 2006	March 2008	Spring 2014
Hunter 2	August 2006	March 2008	May 2010
Huntington 1	April 2008	June 2000 (est.)	Fall 2011
Huntington 2	October 2004	April 2005	April 2007

As noted Hunter Units 1 & 2, and the Huntington Unit 2 permit have been issued, while the Huntington 1 application was just submitted in April '08. The Permit will go out for Public Notice by the end of March 2009, with an estimated permit issuance date of June 2009. These BART permits have emissions limits as shown in the table below .

SUMMARY (Emissions in TPY)			SO2				NOx		
Source	Unit	2006 SO2	2006 NOx	2018 SO2	SO2 (#/mmbtu)	% Change SO2	2018 NOX	NOx (#/mmbtu)	% Change NOx
Hunter (Emery) *	1	3,298	7,288	2,541	0.12	-22.9%	5,506	0.26	-24.4%
Hunter (Emery) *	2	2,535	5,595	2,225	0.12	-12.2%	4,821	0.26	-13.8%
Hunter (Emery)	3	1,505	5,946	1,581	0.09	5.0%	6,147	0.34	3.4%
Huntington *	1	2,889	6,144	2,267	0.12	-21.5%	4,912	0.26	-20.0%
Huntington *	2	14,516	4,987	1,686	0.12	-88.4%	3,622	0.26	-27.4%

* Subject to BART Units

Washington BART

Washington began their BART work by looking at 14 BART eligible facilities. Washington also partners with the Idaho and Oregon in the Northwest Modeling group, and that group completed Washington's initial review in early 2007. That modeling showed four facilities which dropped off the "Subject" list (visibility impacts below 0.5 dV from their BART eligible units were found for Goldendale Aluminum, Phillips 66 Company, Puget Sound Refining & Simpson Kraft in Tacoma). Subsequent remodeling with the same revised ozone data used by Oregon has shown that both the Ft. James Camas (Georgia-Pacific) and the Longview Fibre pulp & paper operations also fall below the 0.5 dV visibility threshold.

The company later remodeled the impact from the ALCOA Wenatchee Works aluminum refinery with 0.5 KM gridding, rather than the standard 4 KM modeling used by the Northwest Modeling group. Washington reviewed the company's model results, and made an official determination that the impacts do fall below the BART threshold such that this plant can be removed from the BART list. With the seven exempted by the BART modeling, there remained six facilities for which Washington had to make BART control determinations.

Washington has permit applications received from the remaining six facilities and is in the process of review of these applications. Applications were received from the two pulp & paper facilities (Port Townsend Paper on December 20th, '07 & Weyerhaeuser Longview plant on December 27th, '07). The applications for the LaFarge Cement plant at Seattle and the INTALCO Ferndale aluminum plant were both received in early December '07. Regarding the two oil refineries: Tesoro Northwest in Anacortes submitted their application February 12th, 2008 and BP Cherry Point Refinery submitted theirs on March 28th, 2008. For these six, Washington DOE now expects to have preliminary BART determinations out for Public Notice in around late April or May 2009. After Public Comment & Review these determinations should be final prior to the end of the 2009 calendar year.

The **Trans Alta Centrailia plant** has two coal fired units with 720 MW gross (702.5 MW net) capacity. The units are already 98% controlled for SO₂ with a wet lime FGD scrubber limiting it to 10,000 TPY annual emissions. EPA had already determined PM and SO₂ BART in a 2002 Reasonable Attributable Visibility Impairment (RAVI) legal action, thus Washington is only reviewing NO_x for control options. The Centrailia BART control analysis was received February 4th, with additional information submitted during the Summer '08. Washington currently feels that completion of BART review and Public Notice of preliminary determinations will occur in April '09, and final determinations made prior to the end of the 2009 calendar year.

Wyoming BART

Wyoming began work on assessing the visibility impact in the first part of 2006 and made their "Subject to BART" determinations and requested BART engineering analyses from the selected facilities in June of 2006. Applications started arriving during the first quarter of 2007, with the last application received from Basin Electric in September '07. However PacifiCorp revised all of their applications in December '07, and all EGU applicants submitted additional information during the first half of 2008. All application documents are available for public review and download from the "BART" link on Wyoming's Regional Haze webpage:

<http://deq.state.wy.us/aqd/regionalhaze.asp>

In their review Wyoming found that five separate coal fired utility plants were "Subject to BART"; those being **PacifiCorp Bridger**, **Dave Johnston**, **Naughton** and **Wyodak** plants, along with **Basin Electric Laramie River Station**, with 13 total individual EGU's located at those 5 plants. And Wyoming initially found that Industrial Boilers at three "Trona" mining (Soda Ash manufacturing) plants were also "Subject to BART". Five of these boilers at the **FMC Green River** and the **General Chemical** [formerly General Chemical] Green River facility were eventually evaluated for BART control. However subsequent refined remodeling in 2008 showed that the FMC Granger Plant's two boilers did not show a visibility impact of 0.5 dV, therefore in the end they were determined to be exempt from further BART analysis.

EGU's

PacifiCorp, who has 4 of the coal fired power plant facilities and 10 of the "Subject" EGU's, provided 4 scenarios in their applications for "Range of Control". There are 230 MW and a 330 MW units at Dave Johnson, a 335 MW unit at Wyodak, four 530 MW units at Jim Bridger, and 160MW, 220MW & 330MW units at the Naughton power plant. These have various firing configurations including tangentially fired, cell wall and wall fired burners.

Regarding NO_x, the control options range from low NO_x burners and overfire air (OFA), up to Selective Catalytic Reduction (SCR) technology. Problems with temperature and sodium content of the coal (catalyst plugging) rendered Selective Non-Catalytic Reduction (SNCR) as technically infeasible. Combustion controls achieve about 60-70% NO_x reduction (about 0.23 to

0.35 lb/MM Btu), while tail end add on SCR can achieve about 90% control (0.15 to 0.20 lb/MM Btu). Space is critical to adding SCR, and not all boilers have that needed room for the equipment. Wyoming is looking at “Neural Net” controllers that act as a management system for real time feedback and improvement in boiler combustion.

Regarding PM control most Wyoming sources already have electrostatic precipitators, thus baghouse addition has a very expensive cost increment. Wyoming is finding that there is not a lot of visibility improvement for the costs ranging from \$5000 to \$12,000 per ton, but there is some additional SO₂ control achieved from baghouses.

Regarding SO₂, as a §309 state Wyoming is getting some proposals that do not meet the SO₂ presumptive levels (0.21, up to 0.41 lb/MM Btu). These sources would install “voluntary” controls to meet the Regional Milestones under §309 of the Regional Haze rule under a “fleet wide” approach to SO₂ reductions. Currently Wyoming is not sure exactly how they will eventually implement sulfur dioxide limits. They likely will simply identify the type of control technology that is required, in lieu of setting an actual SO₂ limit.

Industrial Boilers

The two “Subject” trona plants have a total of 5 boilers that were built during the BART window and Wyoming completed BART permit analyses for these facilities in August 2008. At FMC Green River there are two 887 MM Btu/hr coal boilers (NS-1A & NS-1B) and one 336 MM Btu/hr natural gas fired boiler (PH-3). The PH-3 gas boiler emits essentially no PM or SO₂, and has only combustion air control for meeting its 0.23 lb/MM Btu NO_x emission limit. But individual modeling showed that it had only 0.2 dV visibility impact on the nearest Class I area, so Wyoming determined that it does not contribute to visibility impairment and decided that no additional controls would be required for BART on PH-3.

Regarding the two coal boilers, FMC had applied for a permit modification in 2006 which added Low NO_x Burners with enhanced overfire air and upgrades to the existing alkali scrubbers. These new controls yielded performance of 0.39 lb/MM Btu NO_x (310.5 pph, 1,360 TPY) and 0.54 lb/MM Btu SO₂ over 30 day rolling averages. Wyoming determined that these emission levels meet BART criteria such that no additional control measures will be required, and set the emission limits at these performance levels under their July 17, 2007 permit number MD-5723. No additional controls are required to meet BART for PM emissions from the two boilers either, as existing ESP's meet Wyoming's Permit MD-5723 emission limit of 0.05 lb/MM Btu. Finally, as Wyoming is participating in the §309 SO₂ Milestone & Backstop Trading Program, they will require FMC to participate should that program ever be triggered.

At General Chemical Green River there are two coal boilers: “C” designed at 534 MM Btu/hr and “D” designed at 880 MM Btu/hr. Each boiler is currently equipped with a hot-side electrostatic precipitator (ESP) to control particulate emissions. Overfire air and low excess air are currently used to reduce NO_x emissions and SO₂ emissions are controlled to a limit of 1.2

lb/MM Btu by burning low sulfur coal. Wyoming determined that Low NO_x Burners with separated overfire air (SOFA), yielding performance of 0.49 lb/MM Btu NO_x over a 30 day rolling average (263 pph, 1,152 TPY on “C”, 431 pph, 1,888 TPY on “D”) represents BART for nitrogen oxides, and set these figures as BART emission limits. Once again, no additional controls will be required to meet BART for PM emissions from the two boilers, as the existing ESP’s meet Wyoming’s emission limit of 0.10 lb/MM Btu for these units. And as before, since Wyoming is participating in the §309 SO₂ Milestone & Backstop Trading Program, they will require General Chemical to participate should that program ever be triggered. The Public Notice period for the three trona plant analyses ran 60 days through the first of October, and Wyoming is currently evaluating comments received from that notice. And they are developing the permit proposals for the utility EGU’s that are anticipated to go out for public review sometime during the Spring of 2009. Wyoming still expects to issue these BART permits prior to the end of 2009.

Tribal Sources BART

EPA Region 9 is handling BART for Tribal sources in the WRAP Region. The two Tribal BART sources being reviewed are the **Salt River Project Navajo Generating Station** (NGS) at Page, Arizona, and the **Arizona Public Service Four Corners Power Plant** (FCPP) near Farmington, New Mexico. The SRP Navajo plant consists of three 750 MW coal fired units (2,250 MW total), while Four Corners has two 185 MW units, a 235 MW unit and two 790 MW units (2,185 MW total). Both plants submitted BART Control Engineering Analyses at the beginning of 2008, in response to a July ‘08 EPA request, revisions were prepared a year later. APS submitted their revised FCPP BART Control Engineering analysis in December 2008, while SRP submitted their revised BART Control Engineering analysis for NGS in January 2009.

Both plants went through a Federal Permitting action in recent years to address SO₂ with all units now scrubbed at emission rates ranging around 0.10 - 0.20 lb/MM Btu, so these sulfur dioxide control levels are considered representative of current BART and thus are not being reviewed this time around. EPA is focusing primarily on NO_x and consulted with the four corners states (AZ, CO, NM & UT) about proposals in the range of 0.20 lb/MM Btu (achieved with SCR at Four Corners, but achieved with only low NO_x burners at Navajo). And EPA is also asking about potential additional PM control for these units.

EPA was not planning a website for these BART control applications, so the WRAP posted them at the BART information link of the Stationary Sources Joint Forum webpage at:

<http://www.wrapair.org/forums/ssjf/bart.html> .

The BART proposals for the FCPP in the December analysis recommended 0.48 lb/MM Btu for Units 1 & 2, 0.39 lb/MM Btu on Unit 3 and 0.40 lb/MM Btu on Units 4 & 5, all achieved using

Low NO_x burners (w/ OFA on Units 3-5). PM recommendations are 0.05 lb/MM BTU using existing controls (venturi scrubbers on Units 1-2; baghouses on Units 3-5).

Regarding SRP Navajo, the January '09 BART proposal is 0.24 lb/MM Btu using Low NO_x burners with SOFA, while the recommendation on PM is 0.05 lb/MM Btu using the existing hot side electrostatic precipitators. EPA will continue review of these BART control proposals, looking to make decisions sometime towards the middle of 2009.