

Regional Haze SIP Revision – 2nd 10-Year Plan

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Chapter 10: Long-Term Strategy for Visibility Improvement

Introduction

In this chapter, we describe the State of Washington’s long-term strategy (LTS) for visibility improvement. The strategy covers a 10-year period from 2018 to 2028. We focus both on identifying various existing regulatory mechanisms and those needed in the future to reduce visibility-impairing emissions. Facilities within the state generate these emissions, and we reasonably anticipate them to contribute to visibility impairment in mandatory Class I Areas (CIAs) located within and outside of the state.

The LTS is one of the core components of the regional haze state implementation plan (RH SIP). Section 169A(b)(2)(B) of the federal Clean Air Act (CAA) requires a RH SIP to include an LTS for making reasonable progress toward the national goal of remedying any existing visibility impairment in CIAs resulting from human-caused air pollution and preventing future visibility impairment. The regional haze rule (RHR) also requires that states consider seven factors in developing their LTS (40 CFR 51.308(d)(3)(v)). We discuss those factors later in the chapter.

40 CFR 51.308(f)(3)(i) contains the administrative rules the EPA uses to execute and interpret the CAA’s LTS requirements. 40 CFR 51.308(d)(3) explains that the LTS must include “enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals established by States having mandatory Class I Federal areas.”

The reasonable progress goals (RPGs) serve as benchmarks for progress in meeting the national visibility goal by 2064. We describe RPGs for Washington’s CIAs in Chapter 9 in detail. We measure our progress towards RPGs and success of our LTS by evaluating improvements in visibility on the most impaired days (MID). Thus, we focus Washington’s LTS for this second RH SIP on the controls that would improve visibility on the MID. Reductions in emissions that affect MID will also improve or maintain visibility on the clearest days. Chapter 5 details information about MID.

We identified which pollutants contribute significantly to the MIDs and that we need to reduce during this second implementation period. Interagency Monitoring of Protected Visual Environments (IMPROVE) monitoring data shows that sulfates (primarily), nitrates (secondarily), and Organic Mass Carbon (OMC) are dominant pollution species affecting visibility in the CIAs during the MID. We identified sources of these pollutants from within and outside Washington State. Chapter 11 describes our source selection and evaluation process.

We incorporate the results of the federally-mandated controls to calculate anticipated progress toward the RPGs, but Washington’s emissions control authority only applies to sources and pollutants within the state’s regulatory jurisdiction. Emission sources outside of Washington’s

control include wildfires and prescribed burning, marine vessels and offshore, international emissions, mobile sources, and sources in other states.

We also identified federal, state and local rules, permits and standards that limit haze causing emissions and are either already in place or will be put in place during this implementation period. We rely on these emission controls to decrease emissions during and beyond the implementation period of 2018 – 2028.

Federal fuel and engine rules are of special importance to our progress towards RPGs because they have resulted in large reductions in mobile source air pollution during the last 30 years. Improvements in vehicle and engine design, and cleaner, and higher-quality fuels have reduced emissions so much that we expect the progress to continue, even with more miles driven and more power equipment used every year.

Development of Washington’s long-term strategy

The RHR requires consultation between states on the development of coordinated emission management strategies. This requirement applies both to CIAs within Washington and to CIAs outside of Washington where emissions from Washington are reasonably anticipated to contribute to visibility impairment.

We relied on the Western Regional Air Partnership (WRAP) for air quality modeling and other analytical tools to identify pollutants, the sources of those pollutants, and to predict future levels of visibility impairment. WRAP fostered a regionally consistent approach to haze planning in the western states and provided a sound mechanism for consultation. Consultation among the 15 western states within WRAP has occurred through meetings of WRAP committees, workgroups, and forums with participation by conference calls, face-to-face meetings, and workshops.

Through WRAP technical collaborations, the western states agreed upon the RPGs set for 2028 and a regionally consistent approach to addressing visibility impairment in the West.

Major visibility-impairing pollutants

Controls focus primarily on sulfates and nitrates during the 2018 - 2028 implementation period. The first or foundational RH SIP that covered 2005 to 2018 dealt with both regional haze and reasonably attributed visibility impairment (RAVI). RAVI is visibility impairment clearly attributed to individual sources instead of collective effects from multiple sources over a large area.

IMPROVE monitoring data shows that sulfates (primarily), nitrates (secondarily), and organic mass (OM) are dominant pollution species affecting visibility in the CIAs during the MID. See Chapter 6 for more information on monitoring.

Sulfates

(Note – all numbers will be updated after modeling rerun – we do not anticipate large changes)

During MID, sulfate is the major pollutant contributing to total light extinction (including Rayleigh scattering) in the 2014 - 2018 period. Sulfate ranges from 35 to 50 percent of the total light extinction. In the 2028 projections, sulfate remains the major pollutant contributing to total light extinction at three of the six IMPROVE sites. Sulfate ranges from 28 to 35 percent of total light extinction at these three sites and contributes 25 percent to total light extinction at a fourth site.

Nitrates

Nitrate contributes approximately 9 to 26 percent of total light extinction at IMPROVE sites in Washington in both the baseline period and in 2028 visibility projections. However, nitrate emissions from Washington have a larger and more widespread impact on CIAs outside the state than sulfate on both the MID and the clearest days. Nitrate and sulfate emissions from Washington make reasonably anticipated contributions of 10 percent or more to the total modeled concentrations affecting certain mandatory CIAs in Oregon, Idaho, and Montana.

Organic mass

Organic mass is an important contributor to total light extinction in two different ways with very different implications. Primary organic aerosols and secondary organic compounds compose OMC measured by IMPROVE monitors. Primary organic aerosols (POA) are directly emitted as particulates. Condensation or photo-oxidization of volatile organic compounds (VOCs) form secondary organic compounds.

Organic mass from fire is an important contributor to light extinction. OM is a significant contributor to total light extinction on the MID and the clearest days at all Washington's monitoring sites. The OM signal is notably significant on the Pasayten monitor.

Modeling results show total light extinction increased slightly from the baseline to 2018, where 2018 emissions were projected using an emissions scenario where fire emissions remained constant.

Several CIAs see contributions to visibility impairment due to smoke from fire; we note the effect of wildfire and prescribed burning, especially in data from the North Cascades National Park, Glacier Peak Wilderness, and Pasayten Wilderness areas.

The second way OM is an important contributor to light extinction is emissions from area sources. OM caused 22 to 26 percent of total light extinction in the baseline period and 25 to 28 percent in 2018 visibility projections at the other 4 IMPROVE monitors. Washington's VOC emission inventory is much larger than the POA inventory both in the 2000-2004 baseline period and in 2018. Area sources are the largest human-generated source category of VOCs in 2018. Emissions from solvent use and residential wood combustion dominate these contributions. Both of these

reflect the impact population growth has on the total amount of emissions. The total emissions would be even larger if there were no controls on the areas sources. The following sections further discuss Washington State’s program for residential wood combustion.

State, federal, and local rules and controls that limit emissions of visibility impairing pollutants

The LTS relies on the already adopted federal, state, and local controls on sources of visibility-impairing pollutants that are within the state’s regulatory jurisdiction that it has the ability to control. Ecology actively participated with Western Regional Air Partnership (WRAP) during the development of this second RH SIP. The RPGs and the LTS depend on technical information and analyses by WRAP, and consultation between the states and other stakeholders.

Our LTS relies on certain regulatory controls of emissions. WRAP identified the existing (adopted) rules and the upcoming rules and limits and incorporated the expected reductions into the calculations of expected reductions and improvements in visibility in 2028 (WRAP 2028 modeling). The 2028 modeling used enforceable regulatory mechanisms for the technical basis for this RH to determine our 2028 modeled predictions. The modeling used the following limits.

Adopted rules, programs, and permits

- Mobile source controls
 - Heavy Duty Diesel (2007 and later model year) Engine Standard (40 CFR 86.007-11)
 - Tier 3 Tailpipe Standards (2014). Starting in 2017 it reduced both tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium duty passenger vehicles, and some heavy-duty vehicles. The gasoline sulfur standard will enable more stringent vehicle emissions standards and will make emissions control systems more effective
 - Large Spark Ignition and Recreational Vehicle Rule
 - Nonroad Diesel Engines Rule
 - Low sulfur fuel requirements for gasoline engines, on-road diesel engines, nonroad diesel engines, and locomotives.
- Combustion Turbine and Industrial Boiler/Process Heater/Reciprocating Internal Combustion Engine (RICE) Maximum Achievable Control Technology (MACT) emission.
- Permits and state/EPA consent agreements
- Ozone and Coarse Particulate Matter (PM₁₀) SIPs in place in the WRAP region
- State oil and gas emissions control programs

Of special importance are federal fuel and engine rules for on-road and nonroad engines. These result in large projected percent decreases in visibility-impairing emissions in Washington by 2028. (NOTE: Percentage information will be added).

Additional federal rules leading to emission reductions and visibility improvement:

- Petroleum Refinery MACT Standard
- Boiler MACT Standard
- Revised Utility Boiler MACT
- Various area source MACTs
- Stationary Spark Ignition Internal Combustion Engine Rules
- Locomotive and Marine Diesel Emission Standards for engines with a cylinder displacement of less than 30 liters
- International Maritime Organization (IMO) rules reducing NO₂ and SO₂ emissions from commercial marine vessels
- Corresponding EPA rules for Category 3 Marine Diesel Engines with a cylinder displacement equal to or greater than 30 liters

Controls on visibility-impairing pollutants not in previous RH SIP

Since the last RH SIP, Ecology, EPA, and other federal agencies have adopted or implemented the following programs to reduce emissions from stationary and mobile sources.

Table 2. Control Strategies not in previous RH SIP

Regulatory Program	Affected Sources	Affected Visibility Impairing Air Pollutants
North American Maritime Emission Control Area (ECA) and MARPOL VI	Marine vessels operating within 200 nautical miles of United States and Canada's Pacific and Atlantic Ocean coast lines	SO _x , NO _x , PM _{2.5}
40 CFR Part 94 Marine Engine Requirements	Marine vessels operating in US Waters.	NO _x , SO _x , PM _{2.5}
Motor Vehicle CAFÉ/GHG standards	Light and medium duty on-road vehicles	NO _x , PM _{2.5}
On-road Tier 3 diesel standards	Diesel fueled engines, especially on road vehicles	SO _x , PM _{2.5}
Utility Boiler MACT	Coal fired boilers at electric generating stations	PM _{2.5} , SO _x
Large and Area Source Boiler MACTs	All commercial/industrial boilers	NO _x , PM _{2.5} , SO _x
CISWI NSPS	Industrial/commercial boilers burning designated solid wastes	NO _x , PM _{2.5} , SO _x

Regulatory Program	Affected Sources	Affected Visibility Impairing Air Pollutants
SSI NSPS	Sewage sludge incinerators	NO _x , PM _{2.5}
Revised Petroleum Refinery NSPS and MACT requirements	Petroleum refineries, very large petroleum storage tanks	VOC, PM _{2.5}
2010 NO _x NAAQS	Combustion sources	NO _x
2010 SO _x NAAQS	Combustion sources	SO _x
2013 PM _{2.5} NAAQS	Combustion, area, and industrial sources	PM, PM ₁₀ , PM _{2.5}
2015 Ozone NAAQS	All sources	VOC (organic carbon), NO _x

The most current emission inventory reflects the effects of many of these rules. Specific programs not included in the previous inventory are:

1. MARPOL V
2. The North American Emission Control Area (ECA) for marine vessels
3. The marine vessel fuel sulfur standard
4. NAAQS revisions since 2007

Starting in August 2012, the ECA required marine vessels within 200 nautical miles of the North American coast to use fuels with no more than 1 percent sulfur content, which lowered to 0.1 percent in 2015. EPA and the U.S. Coast Guard share implementation responsibilities for these requirements and have allowed some shipping companies delayed compliance dates with these requirements. Together, these programs require marine vessels to reduce SO₂ emissions the equivalent of changing from 3.5 to 5 percent sulfur by weight fuel to 0.1 percent sulfur by weight fuel. We expect a 70 to 90 percent reduction in SO_x emissions from marine vessels in the ECA area. According to the EPA, by 2020, ships complying with the ECA will reduce emissions of NO_x, SO_x and PM_{2.5} by 23 percent, 74 percent and 86 percent annually below predicted levels without the ECA (EPA Fact sheet 420-F-10-105 March 2010).

The MARPOL V required reductions in NO_x emissions starting in 2011. The EPA Part 90 marine engine requirements phase in NO_x reductions as manufacturers build new vessels or install new replacement engines. Part 90 requires new engines meet Tier 2 requirements in 2011 (equal to the MARPOL requirement) and Tier 3 requirements starting in 2016. EPA estimates that the NO_x requirements will reduce national marine vessel NO_x by 80 percent from 2009 levels. The effects of the marine vessel fuel sulfur requirements are reflected in the IMPROVE data, though the effects of the ECA are not fully reflected in the data due to the long lead time for the MARPOL requirements and the relatively recent date (2013) for vessels to meet the first stage requirements.

Washington State emission limits and shutdowns

- TransAlta Centralia Generation, LLC Power Plant BART Order revision. This is the only coal-fired power generation facility in Washington State. The TransAlta BART Order

was updated in 2020 and was submitted into the SIP in 2020. The BART Order will result in lower NOx emissions while operating as a coal-fired facility. One boiler ceased coal-fired operation in 2020 and the facility will completely cease coal-fired operation by the end of 2025.

- Cardinal Glass, a flat glass facility, submitted a permit modification application to Southwest Clean Air Agency (SWCAA) to install a SCR emission control device and increase production of plate glass. The application also proposed removing the current emission controls of limiting excess oxygen. The permit is currently undergoing a review process. The expected day of completion and issuance of the permit is early 2021. We will update this document once SWCAA issues the permit.
- Ash Grove consent decree. The Ash Grove Cement Company entered into a consent decree with EPA, Ecology, the Puget Sound Clean Air Agency (PSCAA), and other state agencies in 2013 [SEE APPENDIX XX]. The consent decree required the Seattle facility to submit an optimization protocol for the Seattle Kiln to optimize the operation of the Seattle Kiln to reduce NOx emissions to the maximum extent practicable from that Kiln. On August 25, 2016, EPA, in consultation with affected state agencies, reviewed the data and approved the limit of 5.1 pounds of NOx per ton of clinker on a 30-day rolling average.

Other, non-regulatory, factors can result in decreased emissions. Economic and market conditions can drive business decisions that may result in decreased or curtailed production. In Washington, two aluminum smelters are currently in curtailment due to market conditions, one since 2014. Curtailed facilities can resume production at any time so Ecology is pursuing emission control changes. We will provide an update in the next progress report, if appropriate. One of the smelters is in an area that EPA may designate as a non-attainment area, so future operations may require additional controls. Chapter 11 discusses these facilities.

Area and mobile sources

The regional haze rule RHR requires that states identify all anthropogenic sources of visibility impairment considered by the state when developing its LTS, including stationary, mobile, and area sources (40 CFR 51.308(d)(3)(iv)). Chapter 11 discusses stationary sources.

Woodstoves

Woodstove smoke in Washington contributes to visual impairment in the state. Since 2007, Washington has decreased emissions from woodstoves by supporting a woodstove buy-back and exchange program. This program provides grant funding to local clean air agencies and Ecology to replace older woodstoves with cleaner burning woodstoves or cleaner heat sources such as heat pumps or gas stoves or furnaces. Some areas have also run woodstove bounty programs where they buy back older stoves outright. In 13 years, Washington estimates that state and local

governments have bought back or exchanged more than 8,000 stoves for an estimated total reduction of 194 tons of PM_{2.5}.

Recent federal actions also lower the standards for future woodstove emissions. EPA lowered woodstove standards of performance to 2.0 grams of smoke per hour (g/h) in May 2020 for new woodstoves, although they have delayed implementation and enforcement of that standard.

Ecology has determined that state and federal controls on woodstove emissions are sufficient and additional controls are not reasonable at this time.

Mobile sources

Although Ecology does not directly control emissions from mobile sources, they actively participate in programs that reduce mobile source emissions and manage grants that result in reduced emissions and higher fuel economy.

Mobile sources are the largest contributors to NO_x emissions in Washington. Population growth has contributed to mobile source emissions. Factors that have decreased the mobile source emissions have included fleet turnover to more fuel efficient or electric vehicles, and low sulfur fuel requirements.

A program that also contributed to emission reductions from vehicles was Washington's vehicle emission testing program. The program required vehicles in Washington to meet emission limits prior to vehicle registration. The combination of the vehicle emission testing program and advances in vehicle technology led to reduced mobile source emissions. The legislature phased it out starting in 2005 based on Ecology's prediction that more fuel efficient and electric vehicles would replace the need for it by 2020 (RCW 70.120.170). The program ended on January 1, 2020.

Washington has also pursued mobile source emission reductions through the technology of zero emission vehicles (ZEV). Special provisions in the federal Clean Air Act (Section 209) allow states to adopt California's standards instead of the federal motor vehicle emission standards. California's standards contain both low-emission vehicle (LEV) and ZEV requirements. In 2005, the Legislature adopted the California vehicle emission standards for passenger cars, light duty trucks, and medium duty passenger vehicles. The law excluded standards for the ZEV standards and the LEV standards for medium duty trucks (trucks generally weighing between 8,500 and 14,000 pounds). The 2020 Legislature expanded Washington's program to include the entire California program and directed Ecology to adopt rules to implement the ZEV program ([SB 5811](#)). We intend to adopt rules to reflect our expanded authority.

Washington has also pursued grant opportunities that result in decreased emissions from mobile sources. Volkswagen (VW) violated federal and state clean air laws by installing illegal emissions software on some diesel vehicles. In January 2016, the U.S. Department of Justice, working for EPA, filed a lawsuit against VW. After admitting fault, VW reached multiple settlements with EPA and Washington. Washington is managing \$140 million in settlement funds to reduce air pollution

from transportation. As of February 2020 we have committed \$91 million statewide to projects that decrease diesel emissions such as electrification of school buses, transit buses, ferries, state fleet vehicles, port drayage trucks, shorepower, and to installing light duty electric vehicle charging stations.

Ecology determined that there are no other reasonable controls for mobile sources at this time. Thus, our LTS continues to focus on supporting and implementing the existing controls.

Factors required for the long-term strategy

The RHR requires states to consider seven factors in developing a LTS.¹ The factors are described below.

Emission reductions due to ongoing air pollution control programs, including measures to address RAVI (40 CFR 51.308(d)(3)(v)(A)).

Current state and federal rules and state and local air agency permits limit visibility-impairing emissions from point, area, on-road, and non-road engines and mobile sources. The projected 2028 emissions inventory reflects the emission reductions from most rules and permits in existence in 2018.

To obtain a permit, future major and minor new sources or modifications to existing sources will need to meet state permitting requirements; including meeting Best Available Control Technology (BACT) emission limits. Major New Source Review (NSR) permits include requirements to meet Air Quality Related Values (AQRV) protection criteria established by EPA for CIAs.

Ecology and local air pollution control authorities work to reduce emissions from existing emission producing units and to minimize new emissions through the state NSR program. This program requires BACT emission reductions for all new sources and modifications that result in an increase of emissions.

State law (RCW 70A.15.2220) requires that when a company decides to modify or replace an existing emission control system, Ecology or the local air pollution control authority must assure that the modified or replacement control system meets a reasonably available control technology (RACT) level of emissions control. This results in an emission reduction from the stationary source, though not so dramatic a reduction as might be achieved through the NSR program. Processing modifications and replacements of control equipment is an ongoing workload and, from year-to-year, the emission reductions are unpredictable.

¹ 40 CFR 51.308(d)(3)(v)

Emission reductions to mitigate the impacts of construction activities (40 CFR 51.308(d)(3)(v)(B)).

Ecology or a local air quality agency regulates construction activities as a source of air pollution. State air quality rules² address construction activities. Local air quality agencies and local governments have additional rules and policies governing mitigation of air pollution from construction activities. Types of construction permits in Washington include the following:

A prevention of significant deterioration (PSD) permit applies to new large facilities or major changes at existing large facilities that could increase air pollution in an area that meets air quality standards. The intent is to prevent that area's air quality from getting worse.

A notice of construction (NOC) permit is required before installing a new source of air pollution or modifying an existing source of air pollution.

Regulators issue a general order for similar sources of air pollution, instead of a series of individual NOC permits.

An air operating permit (AOP) combines all requirements for operation and procedures, applicable rules, emission standards, monitoring, recordkeeping, and reporting. An AOP is required for major sources that emit or have the potential to emit 10 tons per year or more of hazardous air pollution or more of a combination of hazardous air pollution.

Emission limitations and schedules of compliance to achieve the RPG (40 CFR 51.308(d)(3)(v)(C)).

In addition to existing federal and state rules used to model 2028 RPGs described earlier, emission limits and schedules of compliance include:

TranAlta's Centralia Power Plant 2020 BART Order with reduced NOx emissions and scheduled compliance dates to cease burning coal, described earlier

Cardinal Glass, NO_x reductions from installation of an SCR

Ozone and coarse particulate matter (PM₁₀) SIP requirements

Woodstove and other solid fuel burning device regulations

General smoke standards in WAC 173-433-130

Burn bans in WAC 173-433-150

Prohibited fuel types and regulations on selling, exchanging or giving away an uncertified wood stove or solid fuel burning devices in WAC 173-433-120

² WAC 173-400-040(3) and (8).

Source retirement and replacement schedules (40 CFR 51.308(d)(3)(v)(D)).

TranAlta’s Centralia Power Plant boiler number one will cease coal-fired energy production by the end of December 2020. The entire facility will cease coal-fired operation by the end of will end in 2025. The 2020 BART Order reduces NO_x levels until coal-fired production ceases.

Smoke management techniques for agriculture and forestry management purposes including plans as they currently exist within the state for these purposes (40 CFR 51.308(d)(3)(v)(E)).

Under Washington State law, Ecology and the local air agencies have authority to regulate agricultural burning (WAC 173-430). The state has established controls for agricultural burning to minimize adverse health and environmental impacts. The state works with a variety of stakeholders including agricultural burners, agricultural interest groups, and air quality interest groups to encourage development, research, and use of alternatives to burning.

As part of the regional haze long term strategy, Washington is required to consider basic smoke management practices for prescribed fire used for agricultural and wildland vegetation (silvicultural) management purposes and smoke management programs (40 CFR Section 51.308(f)(2)(iv)(D)). In Washington State the Department of Natural Resources (DNR) issues silvicultural burning permits according to the regulatory direction provided in July 2019 DNR Silvicultural Smoke Management Plan (SMP) (https://www.dnr.wa.gov/publications/amp_sepa_other_smpupdate_smp.pdf). The goal of the plan is to coordinate and facilitate statewide regulation of silvicultural burning on lands under DNR jurisdiction, and on unimproved federally managed forestlands and participating tribal lands. DNR SMP’s strategy is to balance the protection of public health and visibility with the need for silvicultural burning to improve ecosystem health and reduce the damaging effects of catastrophic wildfires. Prescribed silvicultural burning is an area source and prescribed burn plumes can have significant impacts on visibility. Washington proactively addressed this source in its RAVI SIP. Washington incorporated the state’s SMP into the September 1999 revisions to the RAVI SIP and EPA approved the SMP into the SIP in 2003. DNR is currently revising and preparing to update the SMP in the SIP and we will update that progress in the 2025 RH Progress report.

Enforceability of emission limitations and control measures (40 CFR 51.308(d)(3)(v)(F)).

Emission limits on stationary point sources are enforceable as a matter of state law. The following rules contain the authority to require proper operation and maintenance of control equipment:

Chapter 173-400 Washington Administrative Code (WAC), General regulations for air pollution sources

Chapter 173-401 WAC, Operating permit regulation

Chapter 173-405 WAC, Kraft pulping mills

Chapter 173-410 WAC, Sulfite pulping mills

Chapter 173-415 WAC, Primary aluminum plants

Chapter 173-434 WAC, Solid waste incinerator facilities

Local air agency rules for point sources

Woodstove emission limits on new stoves

Ecology and local air agencies rely on field inspections to ensure compliance with the requirements. Existing federal and state rules are enforceable by the agency issuing the rules.

The anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the second control period which ends in 2028 (40 CFR 51.308(d)(3)(v)(G)).

Ecology used the WRAP modeled inventory for this SIP to determine the expected net effect of projected changes to visibility due to emission changes over the control period for the second RH SIP ending in 2028. The effects reflect the implementation of controls on the books

Table 2 below presents the net effects of emission changes on visibility. The net effect for the MID was considered in establishing RPGs for Washington’s mandatory CIA. The modeling results for the clearest days show that we can meet the no degradation goal.

Table 1: Anticipated net effect on visibility of emission reductions over the second control period for MID

Class I Area	2014 to 2018	2028 Projected Visibility (dv)	Improvement (dv)
Olympic National Park	11.9	11.4	0.5
North Cascades National Park and Glacier Peak Wilderness	10	9.6	0.4
Alpine Lakes Wilderness	12.7	11.8	0.9
Mount Rainier National Park	12.7	11.9	0.8
Goat Rocks Wilderness and Mount Adams Wilderness	8	7.5	0.5
Pasayten Wilderness	9.5	9.1	0.4

Table 2: Anticipated net effect on visibility of emission reductions over the second control period for clearest days

Class I Area	2014 to 2018	2028 Projected Visibility (dv)	Improvement (dv)
Olympic National Park	3.6	3.4	0.2
North Cascades National Park and Glacier Peak Wilderness	2.5	2.3	0.2
Alpine Lakes Wilderness	3.3	3	0.3
Mount Rainier National Park	3.9	3.6	0.3
Goat Rocks Wilderness and Mount Adams Wilderness	1	0.9	0.1
Pasayten Wilderness	1.6	1.4	0.2

Summary

Washington State’s LTS for visibility improvement addresses both RH and RAVI. Ecology designed the LTS is to improve visibility in CIAs both within and outside Washington where emissions from the state are reasonably anticipated to contribute to visibility impairment. Ecology designed the LTS to achieve the RPGs in this RH SIP for CIAs inside Washington. It also addresses CIAs outside of Washington where we reasonably anticipate Washington emissions to contribute to visibility impairment. The RPGs serve as benchmarks for progress in meeting the national visibility goal by 2064.

The LTS for this second RH SIP includes the following key points:

- Already adopted federal and state controls, especially federal fuel and engine rules for on-road and non-road vehicles, are important for making reasonable progress by 2028.
- This SIP focuses on improvement to visibility on the MID.
- Washington focuses controls primarily on sulfate and secondarily on nitrate.
- Organic mass carbon emissions are the result of fire and OM is an important contributor to total light extinction in Washington’s CIAs.
- Regional contributions from Canada and Pacific offshore play a significant role in visibility impairment in Washington’s CIAs as do wildfires and prescribed fire, but are beyond the direct control of Ecology.