

AIR QUALITY IN MASON COUNTY

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INTRODUCTION:

In recent months there has been concern raised by a variety of individuals and groups in Mason County regarding the Adage Corporation's proposal to build a biomass energy production facility in Mason County. Simpson Investment Company has for a number of years used wood waste to fuel a boiler that produces enough steam to produce power for their facility's use. Now they propose to remodel or build a new co-generation plant that will produce more power than the company can then sell. Both companies plan to take clean woody biomass (usually wood waste after logging operations and other waste byproducts), use it as fuel to heat water, produce steam that ends up generating power. This current technology is considered "green energy" production and is encouraged by the US Government.

The permitting of such facilities are the responsibility of the local air pollution control agency. The duties of the Health Officer includes providing information to the public as to the causes, nature, and prevention of disease and disability and the preservation, promotion and improvement of health within her jurisdiction. It is also my responsibility to enforce the public health statutes of the state. It is my responsibility to review community health issues and discuss ways to mitigate health risks.

AIR POLLUTION CONTROL AUTHORITY

Olympic Region Clean Air Agency (ORCAA) enforces federal, state, and local clean air laws. ORCAA's Mission is to promote air quality and take actions that protect the health and welfare of people and the natural environment in ORCAA's jurisdiction (Clallam, Grays Harbor, Jefferson, Mason, Pacific, and Thurston Counties).

Washington Air Quality Advisory (WAQA)

WAQA is the Washington State Department of Ecology's (Ecology's) tool for informing people about the health effects of air pollution. WAQA includes information about ground-level ozone, fine particle pollution (PM_{2.5}), and carbon monoxide. WAQA is very similar to the Environmental Protection Agency's (EPA's) national information tool, the Air Quality Index (AQI). Both use color-coded categories to show when air quality is good, moderate or unhealthy. The difference is that WAQA (Washington State and ORCAA) shows the health effects of PM_{2.5} at lower levels than the AQI does. In other words, WAQA alerts us that air quality is unhealthy earlier – with less PM_{2.5} in the air. The WAQA is more protective.

HOW DOES AN AIR CONTROL AGENCY PROTECT HUMAN HEALTH?

There are two ways that air control agencies protect human health. One is by regulating the amount of regulated air pollutants a fixed source (i.e. business or industry) emits. The other is by monitoring ambient air conditions and issuing warnings or alerts to help protect individuals who are sensitive to moderate air pollution.

REGULATION

Air quality standards are set to protect the health of vulnerable people.

The National Ambient Air Quality Standards (NAAQS) consist of two types of national air quality standards: 1) Primary standard - sets limits to protect public health, including the health of “sensitive” populations such as asthmatics, children and the elderly. 2) Secondary standard - sets limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The EPA has set NAAQS for six principal pollutants, which are called “criteria” pollutants. These are carbon monoxide, lead, nitrogen dioxide, particulate matter (PM₁₀ for large particles and PM_{2.5} for finer particles), ozone and sulfur oxides. Units of measure for the standards are parts per million (PPM) by volume or the equivalent of a drop of water in a container with a million drops of water.

In order to obtain a permit to discharge potential air pollutants, commercial and industrial sources have to apply for a permit through ORCAA. The proposed emissions has to pass the requirements of WAC 173-460 – Washington’s air toxics regulation for new sources as well as the EPA standards for regulated air pollutants.

Permit applicants go through a modeling process where they estimate the amount of regulated air pollutants they would produce. The applicants use the worst-case scenario for weather, ambient air condition, and time of year, measuring their potential emissions against the “background” ambient air average to predict whether or not they would cause the ambient air to exceed the NAAQS. Most applicants are extremely conservative in their estimations. In other words, they estimate more emissions than they are likely to produce.

These potential emitters are required to monitor their output on a continuous basis. ORCAA monitors these outputs and regulates these businesses. There are limits set to how much is allowed to be emitted. The permit issued by ORCAA sets the amount of criteria pollutants that may be emitted. These amounts are listed in # tons/year and converted to grams/hour to allow for better oversight and quicker response. By monitoring these direct emissions, ORCAA holds the polluter accountable.

AIR MONITORING

Ambient air monitoring tells us about the air we breathe and allows real-time alerts to vulnerable people.

There is one ambient air monitoring site in Mason County, located at Mountain View Drive in Shelton. The ambient air is monitored continuously and data is available through the Department of Ecology website. Data is available in a variety of forms including the hourly or daily **maximum** level of pollutants and the hourly or daily **average** level of pollutants. The maximum level does not give information about how long the air was at an elevated level, so we have no way of knowing whether the elevated levels lasted for one second, 10 minutes or one hour.

Using a number that can fluctuate every few seconds does not tell us as much about the air we breathe as does the hourly or daily average. Calculating for the month of October as a relative sample, using the average PM_{2.5} per hour, 98 % of the time, the air quality was good or moderate. Based on the monitoring, and the way data is interpreted by ORCAA using a daily average, there were only two days in 2009 when there was unhealthy air in Mason County for which alerts were issued.

Data from <https://fortress.wa.gov/ecy/enviwa/Default.htm>.

Category PM _{2.5}	µg/m ³	Oct. 1 – October 30, 2009	
Good	0 -13.4	695 hours or 93.4%	729 hours or 98%
Moderate	13.5 – 20.4	34 hours or 4.6%	
Unhealthy for Sensitive Groups	20.5 - 35.4	11 hours or 1.5%	15 hours or 2%
Unhealthy	35.5 - 80.4	4 hours or 0.5%	
Very Unhealthy	80.5 – 135.4	0 hours	
Hazardous	135.5 +	0 hours	

AIR POLLUTION SOURCES IN MASON COUNTY

In trying to address concerns about air pollution that affect Mason County, it is important to recognize all the potential sources of environmental air pollution that already exist.

1. Commercial and industrial sources contribute to air pollution in Mason County. These are from businesses and industry that are regulated by ORCAA. Commercial or industrial sources of air pollution are fixed sites within a community. Their emissions are monitored and recorded and contribute to the determination of the Air Quality in a particular geographic area. Emissions from these fixed sites have the potential to impact the area within a few miles of the facility.
2. Mobile sources such as vehicles are a significant source of air pollution, leading to the fact that most urban areas, adjacent to highways and freeways have significantly higher air pollution than their more rural neighbors. Their contribution to air pollution depends on the amount of time the vehicles are in operation, the age of the vehicle, the type of fuel used, the type of roads they travel on, and how long they travel through a particular area. Within commercial or industrial areas in a particular location, the frequency of truck traffic entering or leaving the area has a significant impact on the amount of air pollution present.
3. Machinery that are motor operated or motors used on power boats, etc can also add to the pollution, the numbers are likely low.

4. Wood burning stoves are the primary source of heat for a certain proportion of homes in Mason County. Mason county has a significantly higher percentage of homes that are heated primarily by wood stoves (>30% to WA average of 14%) For the most part, these stoves operate for a few hours each day when the temperature is low enough that home heating is necessary. This occurs mostly in the evenings in winter time but can contribute to environmental air emissions.
5. Wood debris from logging operations and land clearing are left to rot and decompose naturally or are burned in slash piles. When burned, permits are required and available through ORCAA.
6. Forest fires, firefighter exercise, incidental house fires, backyard barbecue grills, burn barrels and fire pits emit a small amount of pollutants locally and affect mostly the immediate surroundings.
7. Gravel mining and vehicular traffic through dirt roads can also contribute particulate matter air pollution.

Although weather does not cause air pollution, weather events may cause the pollutants to remain in an area and affect people's health for a longer period of time. During "stagnant air" conditions, ORCAA advises burn bans to keep the amount of pollutants at a minimum.

AIR POLLUTION HEALTH EFFECTS:

There are people who are particularly vulnerable (or sensitive) to air pollution.

For activities of daily living, most individuals are not affected by pollutants that are in the air. In 2009, in Mason County there were two days when a WAQA advisory was issued as unhealthy for sensitive individuals.

According to the Center for Disease Control, air pollution in the United States poses a public health threat affecting potentially millions of people throughout the country who are particularly vulnerable. It is associated with health problems that include increased emergency department visits and hospital stays for: asthma, breathing and heart problems, as well as increases in illnesses such as pneumonia and bronchitis.

Most of the studies on air pollution health effects are around ozone and particulate matter, especially very small particles 2.5 microns or less (PM_{2.5}.) People with lung disease, children, older adults, and people who are active outdoors have the highest risk of experiencing health problems when air is polluted.

Many scientific studies link ground level ozone exposure to: lung and throat irritation; wheezing and breathing difficulties during exercise or outdoor activities; coughing and pain when taking a deep breath; aggravation of asthma, bronchitis, and emphysema; and a higher chance of getting respiratory illness like pneumonia or bronchitis. Exposure to small particulate matter can lead to: breathing problems, worsening of

asthma symptoms, lung cancer, adverse birth outcomes, increased emergency department visits and hospital stays for breathing and heart problems, and potentially early death.

HEALTH OF MASON COUNTY

Mason County is a largely rural community with only one incorporated city; the City of Shelton. The local recreational resources and natural bounties are a great attraction for most of the nearby urban areas. Forestry and shellfish production are the main industries.

Source: Washington State Office of Financial Management, 2009

Total population Mason County = 56,800

Population age 65 and up = 9,851

Population age 14 and under = 9,651

In Mason County,

32% of adults have high cholesterol

30% of adults are obese

26% of all adults smoke cigarettes

24% have hypertension

10% of all adults are exposed to second hand smoke

8% or about 3,300 people have diabetes

These individuals are at increased risk for heart disease.

11% or about 4,560 adults have asthma

26% of all adults smoke cigarettes

10% of all adults are exposed to second hand smoke

These individuals are at increased risk for lung disease.

MITIGATING HEALTH EFFECTS OF AIR POLLUTION

Individuals with heart and lung disease, young children and the elderly should be aware of the WAQA and pay attention to the advisories given. Persons at risk for poor health effects from air pollution are affected regardless of the source of the pollution.

Considering that most individuals spend about 90 % of the time in an indoor environment, studies of human exposure to air pollutants by the EPA indicate that indoor levels of pollutants may be 2 to 5 times, and occasionally more than 100 times, higher than outdoor pollutant levels.

In addition to outdoor air advisories, vulnerable people can make a significant difference to their exposure in the home by paying attention to; and decreasing, use of wood stoves, open burning, smoking (from cigarettes or barbecues), dust, and chemical irritants.

People with chronic lung disease can decrease their symptoms:

- Reduce the amount of time you spend outdoors when there is an air advisory;
- Plan outdoor activities when ozone levels are lower, usually in the morning and evening;
- Exercise away from roads and highways. Particle pollution is usually worse near these areas.
- Do easier outdoor activities, such as walking instead of running; and
- Do not use a wood stove in your home
- Avoid indoor smoking or exposure to second hand smoke

ADAGE CORPORATION PROPOSAL

The estimated fixed location air emissions are within EPA guidelines and would not require any further study or permit from EPA.

The transportation plan submitted with the SEPA review predicts approximately 100 trucks bringing in materials per day. That works out to roughly 18 trucks per hour to and from the site between 7 AM – 10 PM. The review also predicts 24 motor vehicles to and from site daily for the 12 person staff.

Two routes are available for trucks and vehicular traffic. The most likely heavier traffic will be coming in off US 101, Wallace Kneeland BLVD to John's Prairie Rd then to Production Rd. An alternate route goes through US 3, through downtown Shelton to John's Prairie Rd., then to Production Rd.

The proposed plant is located within the City of Shelton urban growth boundary on Port of Shelton property. The area surrounding the proposed plant is industrial. There are a number of logging yards, truck traffic to the area, and industrial activity. Within a 4 mile radius around the proposed plant are single family homes, two long- term care facilities, Mason General Hospital, Mason County Recreational playfields, downtown Shelton and a number of schools.

SEPA REVIEW

Mason County Development services is conducting the SEPA review. The State Environmental Policy Act (SEPA) provides a way to identify possible environmental impacts that may result from governmental decisions. These decisions may be related to issuing permits for private projects, constructing public facilities, or adopting regulations, plans or policies.

The SEPA Rules establish the requirements for conducting environmental review... Information provided during the SEPA review process helps agency decision-makers, applicants, and the public understand how a proposal will affect the environment. This

information can change a proposal to reduce likely impacts, or to require conditions or deny a proposal when adverse environmental impacts are identified.

DISCUSSION

ORCAA is the air pollution authority charged with protecting the health of county residents from toxic air emissions. They are responsible for reviewing proposed fixed sites of commercial air pollution sources and making a determination based on guidelines set by the EPA. If their review shows the proposed emissions do not exceed the guidelines set by EPA, then the permit would be allowed.

Emissions from vehicular sources are not considered in review by ORCAA because these are not “stationary” sources. Under the SEPA review, the transportation plan is considered because of its impact on traffic and congestion.

Air quality in Mason County is good. Over the last 25 years, standards for air emissions have been tightened, sources of air pollution in the area have been removed and air quality in general is much improved. Among the counties that comprise the jurisdiction of ORCAA, Mason County has comparatively less air pollution from vehicular traffic than nearby Thurston County.

Commercial sources of air pollution are monitored and do not exceed the EPA limits. ORCAA reviews individual proposals like that of Adage Corporation taking into consideration other proposals and the cumulative impact of these proposed ventures on the air quality. Biomass projects will never produce the type of air quality degradation that open burning or saw mill burning used to produce in the past. Each individual source of pollution will have ongoing monitoring so that there is an accounting of the emissions from each source. If an industry or corporation exceeds pollution limits, then ORCAA can act on those sources as part of their regulatory response.

Continuous ambient air monitoring will inform us if there is a change in air quality regardless of air pollution source. The city of Shelton, the proposed Adage Power plant and the Simpson plant are all within a 4 mile radius of one another. The ambient air monitoring equipment is in the same general area and will be able to pick up whether or not there is degradation of air quality. A WAQA advisory is issued based on the daily average concentration of criteria pollutants as measured by the ambient air monitors.

Vehicular emissions are the number one air pollution source in Mason County. The additional truck traffic, and the additional pollutants emitted from these trucks should be calculated and considered in the final analysis of whether or not Mason County will be able to retain the air quality it now enjoys. There are ways to generate estimates of emissions from mobile sources that have been identified in the transportation plan. This was done for a similar proposal for the Port of Olympia involving significant increases in truck traffic through downtown Olympia. The emissions generated by the vehicular traffic would be dispersed through the area that the vehicles travel. Their effect on air quality will be picked up by the ambient air

monitoring system. Vehicular air pollution emissions are the most significant source of air pollution in urban areas. The amount they contribute to a rural county is much less. However, the pollution they contribute to the overall ambient air quality should be considered.

Individuals can take actions to improve their health. There are many sources of air pollution in Mason County. The adverse effect of air pollution occurs regardless of the source of pollution. Decreasing exposure to indoor wood burning, tobacco second hand smoke, and transportation exhaust can decrease the impact to a person's lung and heart health significantly.

RECOMMENDATIONS:

1. A SEPA review should account for the mobile sources of pollution. Recommend that Mason County Community Development ask Adage for a detailed analysis of the potential emissions from the additional truck traffic.
2. ORCAA will continue to monitor ambient air at the current location.
3. Request that ORCAA add another ambient air monitor at the Recreational Complex so that people utilizing this important community resource can have real time information about the air quality.
4. Health Officer will continue to review air quality information during the construction phase and after Adage begins operations, as well as after the Simpson Company remodeling gets underway.
5. Individuals at risk for poor health effects from air pollution should heed WAQA advisories. They can also make individual choices, such as: not smoking, decrease use of indoor wood burning, or not idling cars; that can help decrease their health risk.

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August 4, 2010



August 10, 2010

ATTACHMENT (Pages 11 – 14):

Wilson, Jim, ORCAA Emissions Data Specialist. "EMISSION DISTRIBUTION and MASS RATE of PM-10 by Source Type for Mason County" July, 2010

REFERENCES

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2. Alexanian, Dan, DOH Environmental Assessment. Personal Communication. July 19, 2010
3. Department of Ecology website <http://www.ecy.wa.gov/air.html>
4. Goodin, Mark, ORCAA Engineer. Phone interview. July 26, 2010
5. Handley & Associates. "BIOMASS BOILER&FURNACE EMISSIONS AND SAFETY REGULATIONS IN THE NORTHEAST STATES EVALUATION AND OPTIONS FOR REGIONAL CONSISTENCY" [Online] Available <http://www.mass.gov/Eoeea/docs/doer/renewables/biomass/DOER%20Biomass%20Emissions%20&%20Safety%20Regulations.pdf>, June, 2009
6. Lance, Gordon, ORCAA Engineer. Personal interview, July 30, 2010
7. McNair, Fran. ORCAA Executive Director. Personal interview, July 30, 2010
8. Olympic Region Clean Air Agency website <http://www.orcaa.org/air-quality/>
9. Palcisko, Gary, DOE Air Quality. Personal interview. July, 2010
10. Washington State Department of Ecology Air Quality Program. "2010 Washington State Ambient Air Monitoring Network Assessment" [Online] Available <http://www.ecy.wa.gov/pubs/1002016.pdf>, July 1, 2010
11. Wilson, Jim, ORCAA Emissions Data Specialist. Personal interview July 30, 2010
12. Wiltsee, G. "Lessons Learned from Existing Biomass Power Plants" [Online] Available <http://www.nrel.gov/docs/fy00osti/26946.pdf> , February, 2000

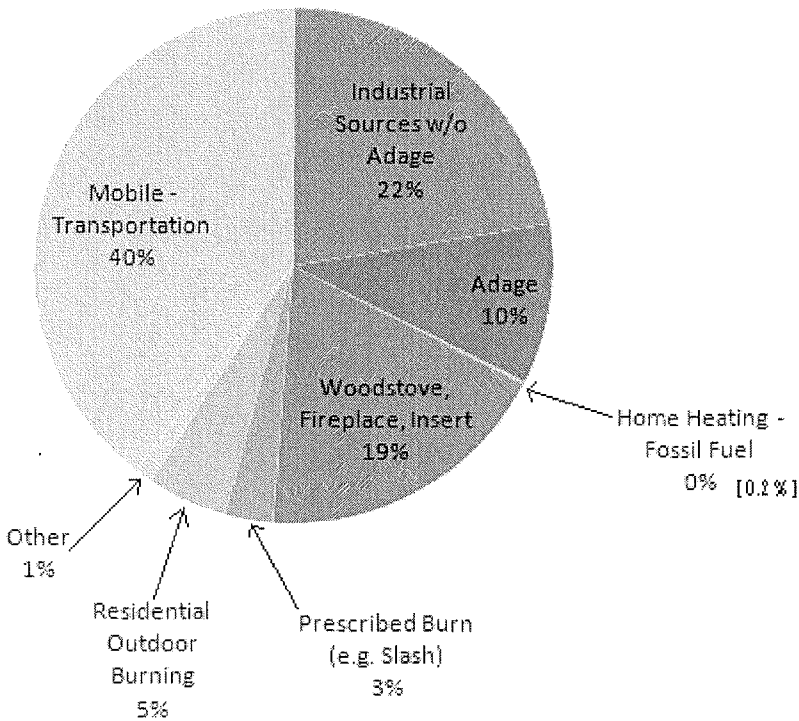
ATTACHMENT:

OLYMPIC REGION CLEAN AIR AGENCY

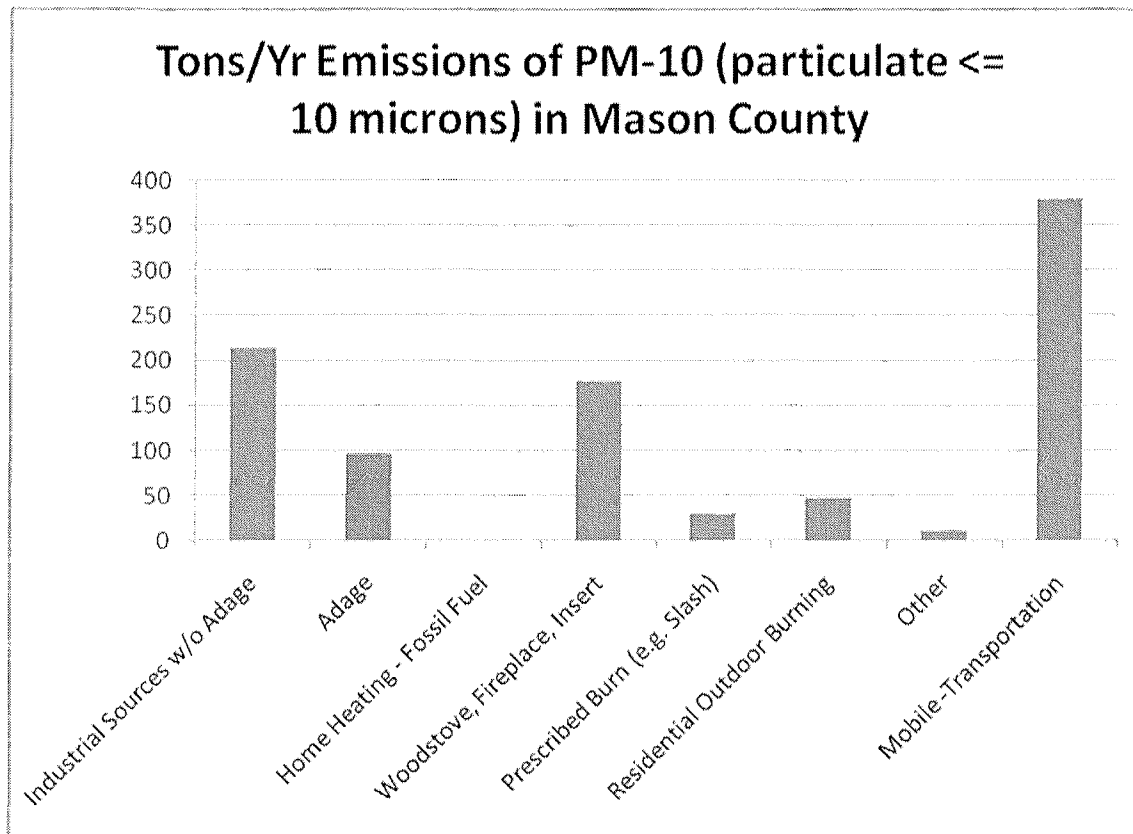
EMISSION DISTRIBUTION and MASS RATE of PM-10 by Source Type for
Mason County

Mason County – PM-10 Emission Distribution

% Emissions of PM-10 (particulate <= 10 microns) in Mason County



Mason County – PM-10 Emission Mass Rate



Data Sources for Pie and Bar Charts: PM-10 Mason County

1. Industrial Sources without Adage, Actual Emissions: 2005 [ORCAA Annual Emission Inventory](#). For more information about the ORCAA Inventory see the ORCAA homepage <http://www.orcaa.org/>. Look under the Air Quality tab.
2. Area and Mobile Sources –Actual Emissions: [WDOE 2005 Comprehensive Inventory](#) (Washington State Department of Ecology) includes Home Heating Fossil Fuel, “Woodstove, Fireplace, Insert”, Prescribed Burning, Residential Outdoor Burning, Mobile, & “Other” For more information about the WDOE data see: <http://www.ecy.wa.gov/programs/air/EmissionInventory/AirEmissionInventory.htm> Look under the Comprehensive Three Year Inventory section, and download the [2005 Comprehensive Emission Inventory Summary Inventory](#).
3. The 2005 emission year is the most current year of comprehensive emissions (Point, Area and Mobil).
4. Adage Mason LLC – Proposed Biomass Boiler: Emission Data is from the analysis of the Adage Permit application (Gordon Lance). The emissions used for Adage are the Potential to Emit (PTE). If Adage is constructed the Actual Emissions may be less than the Potential Emissions.
5. Actual Emissions - The actual emissions that are emitted each year. The values will vary from year to year depending on the hours of operation, rate of production, and any changes to the pollutant generating equipment, fuel(s), materials processed or emission control equipment.

6. Potential to Emit (PTE) is based on maximum conditions: round the "clock" operation (8760 hr/Yr) and maximum production. The PTE emissions are the emissions after the air pollution control device (if a device is present).
7. For precise legal definitions are needed see ORCAA REG 1 Rule 1.4 or WAC 173-400-030]

Data prepared by ORCAA, Jim Wilson, July 2010