PNWIS 2022
October 11-13, Coeur d'Alene, Idaho

Tuesday's Abstracts

Contents

Session I

Track 1

"An Approach to Preparing and Reviewing a BACT Analysis for Air Quality Permitting"
Gary Huitsing (Ecology)

In an attempt to provide an increased level of consistency within the State, the Washington State Department of Ecology prepared a Best Available Control Technology (BACT) guidance document for both preparers and reviewers of BACT analyses. Ecology staff will present the three prioritized BACT options within the guidance, which was prepared in 2021. The input received from local air agencies and EPA Region 10 helped Ecology refine the guidance approach. In June of 2022, additional tools to address BACT for Washington State toxic air pollutants (TAPs) or tBACT were added to the guidance, and are also discussed.

"Permitting a Soil Cleanup Operation with Anticipated Emission Decreases Over Time"
David Finley (Ecology) [YP]

A walkthrough on the permitting process for a soil cleanup site in eastern Washington. The company took initiative to develop plans for soil remediation at the site. Because the action was voluntary and not part of an Agreement Order with any regulatory bodies, emissions from the project needed to be permitted. Special considerations for the project included the anticipated decrease in emission rates over time from the Electric Catalytic Oxidizer used to treat extracted soil vapors from the site. This presentation will highlight how these considerations were incorporated into the Minor Source Approval Order issued to the source.

"Recapitulation of Permitting a Lumber Kiln in the PNW (and Other Actions)"
Jacob Odekirk (Potlatch) [YP]

A review of the permitting process, and subsequent revisions to the permits, for a lumber kiln installed in 2019 on a reservation. The monitoring burden and permit implications with other projects and air activity is considered. A review of current air permitting challenges related to proposed Boiler MACT source testing schedules and Compliance Assurance Monitoring will provide updated food-for-thought.

"Air Permitting Updates for the Pacific Northwest"
Melissa Hillman (Trinity Consultants)

This presentation will provide an overview of updates to local, state, and federal permitting regulations and policies over the recent years. Changes to permitting policies will be discussed as well as recent observations on comments received on draft permits from state agencies and EPA. States that will be discussed in this presentation include Oregon, Washington, Idaho, and Alaska. The audience will learn about what "pit falls" to avoid when preparing or reviewing an air permit application.

Topics will encompass minor new source review/construction permitting regulations, major new source review/prevention of significant deterioration rules, and operating permiting requirements, including the Title V compliance assurance monitoring regulation (CAM Rule, 40 CFR Part 64). The presentation will cover recent observations with respect to Title V renewal applications and draft Title V renewal permits that are reviewed by EPA and the public. Recently, there has been significant scrutiny over CAM rule applicability as well as what is required to be included in a CAM plan. Accordingly, a summary of what to watch out for when preparing a CAM plan will be covered based on recent EPA conclusions.

Track 2

"Mason Bees and Their Effect on the Environment"
John Haney (Haley & Aldrich)

This presentation aims to provide an overview of the Bee's Knees Conservation Project. The presentation will include a brief description of native mason bees (genus Osmia) and their life cycle; diversity and speciation; conservation amidst climate change, monoculture practices, and pesticide use; and ways to increase mason bee populations. We also will briefly cover the introduction of the European Honeybee (Apis Mellifera) to North America and the effect this has had on native bee populations throughout the United States.

Known as a super pollinator species, mason bees are solitary bees that make up a crucial part of our ecology. With 159 different species native to the United States, the mason bee can be found in a diverse range of ecosystems including prairieland, coniferous and deciduous forests, shrublands and deserts. Although not well studied, recent documentation indicates that mason bee populations in the US have declined in the last decade.

The aim of our project is three-fold: conserve Pacific Northwest native bees, increase mason bee populations, and preserve lands conducive to mason bee habitat through education and raised

awareness. Our project began in our own backyard about four years ago but has grown to include additional private land in the Spokane region and in Idaho. Our hope is increase private partnerships while growing to include public lands and conservation areas throughout the Pacific Northwest.

"Use of Injection Wells for Disposal of Industrial Non-Contact Cooling Water"
Keylin Huddleston (Haley & Aldrich) [YP]

Noncontract cooling water up to 10 million gallons a day is generated from an industrial facility and is discharged directly into the Spokane River. A plan has been developed to reduce water use in the facility and eliminate direct discharge into the river by using injection wells for disposal of up to 5 million gallons per day. The design philosophy and testing program of the injection wells will be discussed. The aquifer beneath the site is extremely permeable and consists primarily of gravel and sand with a hydraulic conductivity of up to 3,000 feet/day. Depth to groundwater is generally 60 to 70 feet and fluctuates seasonally by as much as 8 feet. A production well screened at depths of 200 to 300 feet is producing about 8 million gallons per day with about 5 feet of drawdown. Groundwater is used for cooling and is generally about 70 degrees Fahrenheit prior to discharge. The cooling system is continuous and cannot stopped without interfering with the industrial process. The temperature of the river varies seasonally from about 35 to 60 degrees Fahrenheit and is related to the ambient air temperature. Groundwater temperature average 50 degrees Fahrenheit and is remarkably stable seasonally. The goal of the injection system is to dispose of the water, without discharging to the river and without increasing river water temperatures greater than 2 degrees Fahrenheit above background. The ultimate plan is to have three separate injection sites at the facility. Two of the three injection sites have been installed and tested. The goal of each injection systems is to handle approximately 2 million gallons per day (1,400 gpm). This injection system consists of two wells; one well will be used to inject water and the second well will serve as a backup. The injection wells are screened at depths of 200 to 400 feet and were tested at rates ranging from 500 to 2,000 gpm. The maximum observed drawup in the injection wells tested was 10 feet.

"The Race to Net-Zero Mining"
Mitchell Samson (Warm Springs) [YP]

As the world progresses toward the renewable energy transition, the demand for minerals increases exponentially. According to the IEA 2021 Net Zero by 2050 Report, critical mineral production needs to grow six times in order to combat climate change. The need for raw materials used in solar, wind, and EV infrastructure already is causing an increase in mineral prices, which are all expected to continue to rise.

At the same time, mounting pressure on the mining sector has pushed the largest companies to commit to net-zero carbon emissions, ensuring the minerals to support the clean energy economy are also free of emissions. According to a report by McKinsey, "Mining is responsible for 4-7 percent of global greenhouse gas emissions in terms of the sector's Scope 1 and Scope 2 emissions. Including Scope 3 emissions links the sector to around 28 percent of global emissions."

Over the past five years, Warm Springs Consulting (WSC) has been working with exploration companies, operating mines as well as reclaimed sites evaluating and engineering low carbon systems for both haulage and onsite renewable power generation. Moreover, the team at WSC has developed a haulage system study that compares seven different haulage systems on a dollars per ton basis including greenhouse gas emissions. This presentation provides an overview of how to use the energy factors our team developed in planning and operations for unique mine sites. We will also discuss the commercial readiness of technologies in development as well as new financing options available for low-carbon technologies. We will also present case studies where these technologies have been evaluated and implemented, showing what low-carbon haulage and onsite clean and renewable power generation can look like in various operations and climates.

"Potential Use of SCOBY Membranes for Industry and Emergency Response"[1]
Conor Sheehy (Montana Tech) [Student]

As the world population continues to grow and industrial processes continue in order to sustain societies growth, air quality has become a major concern for general public health. Bacterial cellulose membranes (BCM) grown from SCOBY cultures present a unique media in order to filter air, comparable to other industry standard filters, such as non-woven polyester, glass fiber, and activated carbon. Synthetic filters can be expensive to fabricate and operate over time, specially to deploy in remote areas. BCM can be grown in a relatively short time frame (1-week average), and the raw materials to grow the membranes are cheap and readily available even in remote locations. These membranes showed filtration efficiencies of over 95% for particulates >2.5 µm, in small bench scale testing. BCM can also be pretreated, like many other filter media, in order to filter potential toxic gases. Capable of being used in industrial processes, SCOBY membranes also present a unique opportunity to use in personal mask filtration. With the ability to continuously grow in various conditions, BCM present a great opportunity for remote sites or emergency response in which air filtration is needed or to protect soldiers from exposure to lethal or toxic gases in battle fields.

Track 3

"Air Toxics: Examples and How to Lower Their Cancer Risk"
Sebastian Wolfendale (Montrose) [YP]

The presentation will focus on the sources of air toxics, their potency, and how to lower their cancer risk to the community. Case studies on air toxics' effects on community health will be highlighted, as well as how these studies are affecting legislation and enforcement. There will be a breakdown of the types of pollutants emitting from various sources, and how best to test for them. There will be an emphasis on the utilization of detection limits in determining the best practices for testing, analyzing test samples, and the application of the testing data.

[1] "This research was sponsored by the Combat Capabilities Development Command Army Research Laboratory and was accomplished under Cooperative Agreement Number W911NF-20-2-0163. The views and conclusions contained in this document are those of the authors, and should not be interpreted as representing the official policies, either expressed or implied, of the Combat Capabilities Development Command Army Research Laboratory or the U.S. Government. The U.S. Government is authorized to reproduce and distribute reprints for Government purposes notwithstanding any copyright notation herein."

"Oregon CAO Level 3 HRA for a Data Center"
Greg Nostrand (Landau Assoc) [YP]

The development of data centers often involves installation of diesel-fired emergency generators that are used to provide backup power to the facility in the event of an unplanned utility outage. Prior to installing the emergency generators, a project proponent must apply for and obtain an Air Contaminant Discharge Permit from Oregon Department of Environmental Quality (ODEQ). When operating, the emergency generators emit several regulated Toxic Air Contaminants (TACs); therefore, the applicant must satisfy the requirements of Cleaner Air Oregon (CAO) and conduct a Health Risk Assessment (HRA) for these emergency generators as part of the permitting process.
This presentation will provide an overview of the process for conducting a Level 3 HRA for a large data center. Several parts of the CAO HRA process are unique to Oregon and require careful consideration when planning a permitting strategy. The presentation will highlight some strategies that can be utilized when doing the air dispersion modeling using EPA's AERMOD. Additionally, this presentation will provide some lessons learned in developing emission inventories, receptor classification based on exposure characteristics, TAC emission factor selection, risk calculations, and compliance demonstrations. Each of these elements are necessary to consider when developing and submitting a CAO HRA.
"Predicted and Measured COPC Concentrations at the LNG Canada Workforce Accommodation Center in Kitimat, BC"
Peter Reid (Stantec Consulting)

"Lessons Learned in Toxic Air Contaminant HRA And Permitting"
Macenzie Billings (ODEQ) [YP]

The Oregon Department of Environmental Quality's (DEQ) Cleaner Air Oregon Program (CAO) regulates health risk from toxic air contaminants (TACs) emitted from both new and existing facilities. This is a big deal for existing facilities: it is extremely challenging to quantify and model emissions of over six hundred TACs, assess TAC-related risk, and subsequently permit facilities that have been in operation for decades.

Oregon's officially done it! From fiberboard production facilities to oil and glass recycling facilities, CAO has completed TAC health risk assessments and issued health-protective permits for five existing facilities since the program's inception. Some facilities clearly demonstrated that health risk to nearby receptors is low, and some evaluated multi-pathway risk to determine just how much air inhalation impacted receptors near their facility.

In this session, DEQ staff will share lessons learned in gathering TAC source testing data, evaluating multi-pathway adjustment factors used for risk assessments, and incorporating emission limits into permit conditions that are health-protective and help facilities demonstrate permit compliance. Don't miss it!

Session II

Track 1

"Anyone can model: Creating a user-friendly CALPUFF program"
Katie Kolesar (Air Science)

The project involved creating a simple software tool to manipulate emissions inventories for a region, run CALPUFF, and visually represent the data. The user walks through menu prompts to be able to add, scale, edit, and remove sources within the domain. Then the user can initiate a CALPUFF run from the program. After CALPUFF has completed running, the ambient concentration and deposition rates at points of interest are calculated and visually represented. Now, anyone can run CALPUFF!

"Developments in Regulatory Air Modeling and Permitting of Offshore Sources"
Jay McAlpine (EPA R10)

The recent explosion of wind energy development along the U.S. east coast has driven the EPA to update policy and modeling tools for offshore air permitting. Outer Continental Shelf (OCS) air permitting policy and assessment methodology originated with a focus on offshore oil and gas development but has had to evolve to integrate recent OCS wind energy development. In this presentation, we will explore recent and current OCS air permitting activities and the related modeling approaches and policy decisions. Particular focus will center on the EPA's recent approvals of the AERCOARE-AERMOD OCS model and current efforts to integrate OCS modules into AERMOD. We will conclude with analysis of how these developments may affect future OCS air permitting of wind energy and oil & gas projects off the coast of Alaska, Washington, and Oregon.

"Yakima Valley Wintertime PM2.5 Modeling Study "
Tes Berhane (Ecology)

The Yakima Valley (YV) region in Washington State is in attainment for the daily average PM2.5 (Particulate Matter with aerodynamic diameter of 2.5 micrometer or less) Federal standard. However, wintertime observed concentrations are often close to the standard in that there is a possibility the YV may be categorized in a non-attainment classification in the future. The flat surface of the YV bordered by pronounced hills provides a suitable sinking of air when air stagnation develops mainly during wintertime high-pressure system. This meteorological phenomenon traps PM2.5 at a ground level, reaching a potential concern to a Federal standard and hence human health. To understand the magnitude of the primary and secondary sources of PM2.5 and recommend a mitigation strategy, Ecology performed a modeling study using EMAQ (Ecology Modeling for Air Quality) system. It incorporates WRF model for meteorological modeling at 1.33km horizontal grid resolution to resolve complex terrains, SMOKE for emissions inventory and CMAQ for photochemical processing of the atmospheric gases.
The project utilizes two wintertime meteorological events representative of local weather conditions. The January 2013 and the October 27 – December 08, 2019 cases are used to evaluate the EMAQ modeling system performance and simulate multiple brute-force reduction scenarios. Preliminary modeling results have shown that vehicular and residential wood combustion emissions reduction scenarios produce results in a significant reduction of secondary

PM2.5 in the valley. The diary ammonia (HN3) reduction, on the other hand, causes little if any in secondary particulate matter reduction. Therefore, this study potentially indicates that the YV is a NOx limited region, where any reduction in a ubiquitous HN3 does not bring useful drop in particulate matter production.

"Using EPA's MOVES model to explore air quality emissions from highway traffic"
Lyndsey DeMarco (Air Sciences) [YP]

Near road air pollution (NRAP) levels were modeled from vehicle traffic using two very distinct methodologies: 1.) statistical modeling of traffic parameters and observed meteorological data and 2.) model workflow estimating emission rates using EPA's MOtor Vehicle Emission Simulator (MOVES) combined with AERMOD dispersion model with observed meteorological data. A suite of air pollutants was measured continuously 15 meters away from a heavily trafficked freeway in Hillsboro, Oregon to assess both approaches. This process was done in an effort to refine model approaches for future planning purposes. In this presentation, we will discuss some of the benefits and challenges of each approach to estimate NRAP and how the results compare.

Track 2

"What Lies Beneath: Uncovering a Landfill Closure Three Decades Later"
Jen Lennon (City of Spokane) [YP]

Nearly thirty years after the official closure of the 150 acre Closed Refuse Unit (CRU) of the City of Spokane Northside Landfill, the cap, cover, and landfill gas (LFG) collection systems are showing their age. Areas of localized settlement, dead vegetation, and cracked soils indicated a need for further investigation and repair, while decreases in gas quantity and quality were suspected to be the result of not only the predictable decline in gas production over time, but also LFG collection system condition. To address these issues, the City engaged Jacobs and Glacier Construction to design and carry out a large-scale landfill investigation and repair project with initial planning beginning in 2018, culminating in ground work in the summer of 2021. This presentation will review the findings and corrective action performed to ensure proper landfill function for the next thirty years.

"Measuring VOC Emission Rates from Green Waste Composting"
Tom Jobson (WSU)

The WA state public policy goal of the diversion of municipal organic wastes from landfills to composting facilities is intended to reduce greenhouse gas emissions and promote sustainable agriculture. The unintended consequence is the necessary expansion of composting facility capacity may cause some facilities to be classified as major air pollution sources for volatile organic compound (VOC) emissions. This imposes the expense and complication of requiring a Title V air permit. VOC emission factors from composting facilities are not well understood. California conducted studies 15 years ago on emission factors from windrows to determine total VOC emitted by carbon mass. Most larger compost facilities in WA State use mechanically aerated systems that provide better air flow and temperature control than windrows and these systems are thought by industry to reduce VOC emission rates compared to windrows. This

presentation reports initial results from an on-going study examining VOC emission rates from the recently built WSU compost pilot plant. The plant is a two zone mechanically aerated facility. The piles are ~ 40 cubic yards in size with feedstocks being municipal green waste and green waste / food waste mixes. The facility can provide negative aeration, positive aeration, or reversing air flow conditions. The purpose of the study is to compare emission rates from two piles simultaneously using in-situ sampling by a proton transfer mass spectrometer to measure speciated VOCs in real time. This measurement is complimented by grab sample collection into SUMMA canisters and analysis by GC-MS. Operating two piles at different conditions allows us to investigate how emission rates relate to composting key performance indicators such as temperature and oxygen levels. Initial results indicate that methanol emission can be very large at high pile temperatures.

"Addressing widespread lead and arsenic contamination from past pesticide applications"
Valerie Bound (Ecology)

The pesticide lead arsenate was used extensively for almost six decades to treat and protect central Washington's orchards. Unfortunately, the contamination from that practice left a legacy of widespread soil contamination. Valerie will discuss how her agency handled this issue, from soil sampling and cleanup to politics, outreach, and environmental justice.

"Remediating Petroleum Hydrocarbon Contaminated Soil in Northern Climates via Soil Treatment Facilities"
Erin Hallenburg (Coeur Mining)

The Coeur Silvertip Mine is remotely located on the border of British Columbia and the Yukon. Coeur Mining, Inc. (Coeur) was established in 1928 at the Coeur d' Alene Galena Mine. Today, Coeur is one of the premier U.S. based mining companies, with mines located in Nevada, South Dakota, Alaska, Palmarejo (Mexico), and British Columbia. Coeur's Silvertip Mine is currently in a resource exploration development phase. This mine site is subjected to extreme cold temperatures, long sunless winters, and significant snowfall followed by an extended dynamic spring thaw.

Concentrations of hydrocarbon constituents in excavated soils can be effectively reduced through biodegradation. Bioremediation technology is a controlled process which involves constructing cells of contaminated soils and stimulating microbial activity within the soils through aeration and/or the addition of nutrients and moisture. The Ministry of Environment imposes design, operation, and maintenance criteria for hydrocarbon contaminated soil treatment facilities (STF). Silvertip mine, because of its remote, northern location, is a prime candidate for an STF. Long hauls are required for shipping contaminated soil to licensed disposal facilities. Besides being costly, winter conditions that are present 8 months of the year make hauling potentially dangerous.

This presentation discusses the challenges of building a STF. The conceptual design, professional review, development of the operation & maintenance plan, and regulatory commissioning of the STF.

Track 3

"Success and Shortcomings of the Federal Clean Air Act in Its First 50 Years"
Merlyn Hough (Ret LRCAA)

In 1970, Congress approved the modern Clean Air Act. Widely considered to be one of the most impactful and successful environmental actions due to its pervasive effect on health, the environment, and the economy, the Clean Air Act and its subsequent amendments put into place a wide range of regulatory programs with the specific purpose of improving the quality of the nation's air resources and promoting substantial economic growth and innovation.
The 1970 Clean Air Act (with updates in 1977 and 1990) requires EPA to set health-based standards for ambient air quality, sets deadlines for the achievement of the air quality health standards by state and local governments, requires EPA to set national emission standards for significant sources of air pollution (such as motor vehicles, power plants, industrial sources), mandates emission controls for 187 air toxics, imposes a cap-and-trade program to address acid rain, requires the protection of air quality in areas with clean air, requires visibility restoration in national parks and wilderness areas, imposes an operating permit program for major industrial sources, and implements the phase-out of most stratospheric ozone-depleting chemicals.
Since the passage of the Clean Air Act, the combined emissions of six criteria pollutants have been reduced by over 70% across the United States, specifically: Particulate Matter (PM), Sulfur Dioxide (SO2), Nitrogen Dioxide (NO2), Ozone (from precursors of NOx and volatile organic compounds or VOCs), Carbon Monoxide (CO), and Lead (Pb). Emissions of toxic air pollutants (such as mercury, benzene, asbestos, and many others) have decreased significantly as well. Notably, these improvements occurred as the economy grew markedly and energy use and traffic increased.

Thus the Clean Air Act is responsible for decades of dramatic reductions in air pollution, saving hundreds of thousands of lives. However, much work still remains to address climate change and to ensure that everyone has healthy air to breathe both indoors and outdoors.

This presentation summarizes the major successes of the Clean Air Act over its first 50 years and identifies some areas of unfinished business.

"New HAP Listing: What Does it Mean for Puget Sound Sources"
Maggie Corbin & Chris Kitchen (PSCAA)

EPA has made their first addition to the hazardous air pollutant (HAP) list since the 1990 CAAA. As of February 4, 2022, 1-Bromopropane is officially a HAP. This presentation will provide an overview of the listing process, review how it might impact facilities in the Puget Sound region, and discuss the steps the Puget Sound Clean Air Agency has made to reach out to these facilities.

"PFAS – Who is Regulating It Now?"
Beth Fifield Hodgson (Spring Environmental)

Per and Poly-fluoroalkylated substances are in the media around the country today related to water quality concerns but EPA has been updated other regulations as well including CERCLA and TRI. Are any of these regulatory changes likely to affect me? Do I have to do anything differently? If we don't use AFFF fighting foam, do I have to pay attention to all these discussions?