



Jessica Spiegel

Senior Director, Northwest Region

November 16, 2021

Sent via e-mail and upload to: <https://aq.ecology.commentinput.com/?id=9m3jh>

Ms. Rachel Assink
Air Quality Planner, Policy and Planning Section
Washington State Department of Ecology
300 Desmond Drive SE
Lacey, WA 98503

Re: WSPA Comments on Washington Department of Ecology Rulemaking for WAC 173-441

Dear Rachel,

Western States Petroleum Association (WSPA) is a trade association that represents companies which provide diverse sources of transportation energy throughout the west, including Washington. This includes the transport and market petroleum, petroleum products, natural gas, and other energy supplies.

We appreciate the opportunity to comment regarding the Washington Department of Ecology (Ecology) rulemaking process to update WAC 173-441 to comport with the Climate Commitment Act, inclusive of a Cap-and-Invest program. WSPA members support broad based market policy to reduce carbon emissions and see the data reporting rulemaking as an essential element to enable that path forward. It is important that we get this enabling reporting framework correct to support the compliance options needed in such a program.

It should be noted that the new reportable data related to Complexity Weighted Barrel (CWB) is indicative of benchmarking methodology that is used in California for allocation of allowances for EITE refinery entities in its program. WSPA worked with the California Air Resources Board (CARB) in California to develop this baseline methodology and are generally supportive of it. However, it has not been discussed relative the baseline opportunities created in the Washington Cap and Trade bill (HB 5126) and therefore addition of this data elements may be premature.

As discussed in more length later in this letter, this baseline style also requires instrumentation and equipment, some of which may need to be added to facilities during turnarounds to acquire the data. WSPA member companies request further discussion with Department of Ecology before this element becomes codified.

The timeline for new reporting requirements raises concerns

WSPA has many questions and concerns with the timing and scope of certain new reporting, especially as it relates to petroleum refineries. First, we are concerned about the requirement for

certain new reporting for the 2022 program year beginning in 2023. Per the July 22, 2021 workshop presentation, the new reporting content for most reporters – including fuel suppliers, operators, owners, and refiners – would begin March 31, 2023 for reporting of 2022 data. Such a requirement is not clear in the proposed regulation.

Second, many new reporting requirements are being proposed by this rulemaking, and parties will need time to implement these requirements following adoption of the final rule. Indeed, Ecology's proposal would require reporting entities to collect certain new data starting January 1, 2022 **before** the 173-441 amendments are finalized and adopted. WSPA recommends that Ecology postpone implementing the new reporting content until 2024, reflecting 2023 data; or, alternatively, Ecology should stipulate that the collection of data in 2022 if collected and submitted in good faith during a "learning period" is not subject to enforcement action. This would be reasonable given that 2022 data would not be subject to an emissions cap. Formally implementing the new reporting content in 2024 – that is, beginning with 2023 data – will allow companies to collect and report data per the new regulations with adequate time to train personnel and implement new procedures for the entire reporting year.

In addition, a critical issue with proposed reporting requirements is that refineries may not have the metering equipment and/or instrumentation currently onsite; or, may have the equipment that is not set up to standards that would be necessary to report out the data as referenced in WAC 173-441. As a result, regulations must provide the option of using alternative data collection methods in the early years of the program to allow facilities the timing and ability to install / update instrumentation. Some of these changes would require a full facility shut down (turnaround) to add the instrumentation safely into the processes for measurement.

California identified this issue at the beginning of its 2013 Mandatory Reporting Regulation (MRR) and added a provision that allows for a phase-in approach of the requirements recognizing facilities would require time to address non-custody transfer metering. Accordingly, the MRR was revised to state in its §95103(h)(4) that "Facility operators may use best available methods for reporting and calculating covered product data listed in section 95113(I)(3)...". It should be noted that while this phase-in approach was part of the 2013 MRR rulemaking, it was subsequently revised in the 2016 rulemaking that was approved on September 1, 2017 (effective 2018) to instead give facilities five years to design, install and test new or modified instrumentation during routine and planned maintenance periods.

Further, WSPA recommends that the data collection related to the CWB in Table 050-1 be removed and addressed in a separate rulemaking relative to the rest of the data in the WAC 173-441 because of the complexity of the data collection for deriving the CWB. In addition, use of CWB suggests acceptance of a specific methodology for refinery baseline collection for use under WAC 173-446. Given that discussion of the appropriate metric for refinery baseline development has not yet occurred in WAC 173-446, this inclusion of CWB data collection now in WAC 173-441 is premature.

WSPA strongly encourages Ecology to work with reporting entities to ensure operational ability for the 2023 reporting year. Based on our experience in other states, it is better to work on items such

as templates, system updates, log-ons, etc. well in advance of reporting deadlines to ensure a smooth start-up / transition.

Reporting needs to balance breadth versus burden

WSPA supports Ecology's need to gather comprehensive greenhouse gas emission data from all significant sources to allow accurate measurement of progress towards achieving State's GHG emission reduction goals, particularly from new sources not previously covered under WAC 173-441, as well as to provide the necessary backbone for the Cap-and-Invest Program that is enacted by the Climate Commitment Act.

However, the amendments to the GHG reporting regulation should not result in new large time or cost burdens on Washington businesses. The proposed amendments should be reasonable in scope. For facilities such as refineries, Washington data and reporting requirements should be consistent with U.S. EPA reporting requirements to not create inconsistent / conflicting information and reduce the administrative burden.

Missing Data Substitution Procedures are Inconsistent with U.S. EPA's Methods

For facilities such as refineries, Washington data and reporting requirements should also be consistent with U.S. EPA's mandatory GHG reporting requirements in 40 CFR. Part 98, so as to not create inconsistent or conflicting information and to reduce the administrative burden.

As WAC 173-441 is currently proposed, Ecology will require a reporting entity submit GHG emission reports to Ecology using the U.S. EPA's electronic GHG Reporting Tool (e-GRRT). WAC 173-441-050(8)(h) further requires that a reporter comply with 40 CFR. Part 98 when substituting for missing data, except if the reporter is substituting missing data for emissions calculations under Subparts C, H, P, Y and AA of 40 CFR. Part 98, in which case the reporter must then comply with specific methods listed under WAC 173-441-050(8)(h)(i). Due to U.S. EPA and Ecology requiring different methods for calculating the same missing data, a reporter can end up with two different emissions estimates. Ecology has not addressed these procedural differences between 40 CFR Part 98.35(b) and WAC 174-441-050(8)(h)(i) for substituting missing data in Subparts C, H, P, Y, and AA.

It is worth noting that California identified this same issue as well as other harmonizing issues while it was developing its MRR and built its own California e-GRRT system as a result to allow for differences in reporting methods to be addressed by reporting entities. Where Ecology's draft GHG Reporting Rule presents similar issues, Ecology must resolve the discrepancies before adopting this regulation. Accordingly, WSPA urges Ecology to adopt the Federal U.S. EPA procedures in whole for estimating missing data.

Third party verification is important, but requirements need further precision

WSPA supports third party verification (TPV) for covered entities with 25,000 metric tons of covered CO₂e emissions or more per calendar year.

For example, if a company were to provide fuels that emit 30,000 metric tons (MT) of CO₂e upon combustion by the consumer, but 20,000 MT CO₂e are from biofuels that are exempt under the new Cap-and-Invest program, that covered entity should not need to undergo a TPV. We recommend making this clarifying change to the regulations to reduce the requirements for small biomass operations and to reduce the TPV workload for Ecology staff.

TPV should be measured in its scope since it adds new costs on businesses. Ecology should be clear with verifiers and reporting entities regarding what information is to be reviewed to ensure a smooth verification process. Specifically, the verification should be limited to validating the process and data integrity used by the reporting entity. For example, the regulations as written do not require reporting of petroleum fuel by seasonality or grade. Given this, a fuel reporting entity should not be required to produce data by seasonality or grade.

In our opinion, the additional rigors of TPV are only justified if a market-based program such as the proposed Cap-and-Invest regulation is adopted. While we expect that to be the case, we recommend that the TPV section be written where TPV is only required if Cap-and-Invest is adopted and only years when there are Cap-and-Invest obligations. Further, regulations should state that TPV is suspended if Washington's Cap-and-Invest program were to be suspended.

Provisions for New Technologies Must Be Incorporated in the Updated Rule

The revised regulations must anticipate new developments in carbon emission reductions such as new renewable fuels and carbon removal technologies, both of which will be important to help Washington meet its aggressive climate goals. Almost all major studies that examine pathways to achieve major GHG reduction have identified use of carbon removal technologies as critical to success. Various applications of carbon removal technology are operating in the U.S., Canada and globally, and many new projects have been announced.

WSPA notes that Section 173-441-122(3) for suppliers of carbon dioxide allows reporters to report, consistent with federal Subpart PP, the volume of CO₂ captured from facilities for other use, including for geologic sequestration. WSPA strongly supports this reporting and is pleased to see parallel intent in the initial proposed Cap-and-Invest regulatory language that would make CO₂ stored in geologic formations not subject to obligation under Cap-and-Invest.

The language in 173-441-122(3)(i), however, is too narrow in that it speaks only to CO₂ captured from "production process units." We recommend that the language be expanded to also allow reporting of CO₂ captured from other sources that are not "production process units." For example, the reporting should include volumes of CO₂ captured from other negative carbon technologies such as Direct Air Capture (DAC) where CO₂ is removed directly from ambient air.

It is important to get the reporting of CCS and DAC into the reporting regulation correctly, including associated reporting data tables, to ensure carbon removal technology is provided as a compliance option within the planned Cap-and-Invest and Clean Fuels Program regulations. WSPA stands

ready to help Ecology craft appropriate language on this topic.

Confidential Business Information

WSPA member companies have been performing an in-depth review of the new data which would be added to the GHG reporting rule by this updated WAC 173-441 rulemaking, specifically as it relates to confidential business information status of data. The Subpart MM data elements requested have already been found by Ecology to be Confidential Business Information (CBI) in the previous Clean Air Rulemaking. Additional elements, particularly surrounding the Complexity Weighted Barrel (CWB) data and Fuel Supplier Data, would also likely be considered CBI. Due to the tight review timeline, the compilation of this information by individual member companies is still occurring. WSPA member companies requested that Ecology be informed that individual requests for review of these data elements will be coming into the agency soon.

More Detailed Comments Regarding Proposed WAC 173-441, By Rule Section

WAC 173-441-020 Definitions

In (1)(a), WSPA is not clear on the purpose of *“References mentioned in this rule are adopted as they exist on July 1, 2021, or the adoption date in WAC 173-400-025(1), whichever is later.”* If the purpose is to ensure that the Washington GHG reporting always remains consistent with U.S. EPA GHG reporting, we support this goal. If this has another intent, we would appreciate explanation and suggest clarification may be needed to better communicate actual intent.

In (1)(b), WSPA supports the proposed broad definition of ‘biomass’ and “biomass-derived fuels”. Since biofuels will have a very different emissions obligation than petroleum fuels in the future Cap-and-Invest program (173-446), it is important to apply a broad definition to properly anticipate potential new biofuels in future years. Too narrow of a definition could discourage new biofuels, to the detriment of Washington’s climate goals. Please see our related comment for 173-441-122 below.

WAC 173-441-030 Applicability

In (2), WSPA supports the emission reporting threshold of 10,000 metric tons per year (mtpa) of CO₂e for both Facilities and Suppliers but recommends a threshold of 25,000 mtpa for defining covered sources under the planned Cap-and-Invest program.

In (6), WSPA recommends that recordkeeping be required for five years versus the proposed ten years. Further, this recordkeeping requirement should apply for records starting with 2023 data, and not be retroactive.

WAC 173-441-050 General Monitoring, Reporting, Recordkeeping, Verification Requirements

As a general point, WSPA sees no discussion in this section regarding how to handle a situation where two business subject to reporting are co-located and share utilities. This co-location may not have triggered any special requirement under the existing WAC 173-441; but, under an anticipated Cap-and-Invest program, this will likely be a concern. WSPA requests Ecology provide co-located regulated parties direction on reporting and verification of GHG data.

In (2)(a) Schedule, the proposed amendments do not change the report annual submission date of March 31. WSPA notes that is consistent with the federal MRR date but recommends that the Washington submission date be revised from March 31 to April 10 to allow additional time to gather the significant new product data required in Table 050-1 that is not required by U.S. EPA and to be consistent with the California MRR submittal date.

The proposed amendments add new data requirements (e.g., Table 050-1 product data, fuel supplier data). The rule should be clearer on the year this new data reporting would first be required. WSPA recommends that the first year for reporting of new data be 2024 for the 2023 data, if the Cap-and-Invest program is first effective in 2023, or the first year the Cap-and-Trade program is effective, whichever is later.

In (2)(n) Facility Product Data, as discussed earlier in these comments, Table 050-1 would require that Petroleum Refineries report CWB as described in California's MRR section 95113(1)(3). The CWB calculation is an engineering-based carbon-weighted mathematical summation of the throughputs to the many different process units that exist in refineries. WSPA presumes that Ecology is requesting CWB data for the purpose of allowing Washington refineries to determine facility carbon intensity (e.g., CO₂e per CWB) for prior years and/or future years. WSPA notes that refineries have typically not collected CWB data (process unit throughput data) for the potential Cap-and-Trade baseline years of 2015-2019, nor for 2020-2022. The required meters and other instrumentation may not be in place, and therefore this historic information may not even be available. Any CWB data for prior years that may be available may not exist within a required accuracy of 5%.

Again, as already highlighted in these comments, as discussed above, WSPA urgently requests discussion and clarity on the purpose of collecting CWB data and when CWB data would first be reported and strongly recommends deferral of CWB data requirements to a separate WAC 173-441 rulemaking.

In (3)(n) "Operating facilities" include many different parts; some facilities may be co-located within another. As written in the proposed rule, a co-located facility may not receive appropriate treatment in the program. WSPA requests that facilities be given the option for product data to be reported by the applicable NAICS Code and not just the primary NAICS code, consistent with the California MRR.

In (6) Recordkeeping, WSPA recommends that records be kept for five years versus the proposed ten years. Further, this recordkeeping requirement should apply for records starting with 2023 data, and not retroactively.

In (6)(e)(i)(D)(iv), WSPA requests the language associated with the notification timing be the same as that found in 173-441-050(6) which states “within 15 business days of receipt of the notification, unless a different schedule is agreed to by Ecology.”

In (8)(a) requires “[a]ll other measurement devices” to be calibrated but are not subject to accuracy requirements. This is inconsistent and more stringent than the California MRR. The CARB Petroleum Refineries and Coke Calciners Reporting Guidance¹ allows instruments used to volume correct CWB streams to use best available information. WSPA requests Ecology remove the calibration requirements from “all other measurement devices.”

Again, in (8)(c)(2), WSPA requests this measurement accuracy requirement not apply to any meters within the CWB calculation. As noted earlier in these comments, CWB meters and required instrumentation may not currently exist and would need to be installed during the next available unit downtime. In the interim, data estimation using alternative methods should be allowed and specially noted as such in regulatory language.

(8)(h) - Missing Data Substitution Procedures are Inconsistent with U.S. EPA’s Methods

For facilities such as refineries, Washington data and reporting requirements should also be consistent with U.S. EPA’s mandatory GHG reporting requirements in 40 CFR. Part 98, so as to not create inconsistent or conflicting information and to reduce the administrative burden.

As WAC 173-441 is currently proposed, Ecology will require a reporting entity submit GHG emission reports to Ecology using the U.S. EPA’s electronic GHG Reporting Tool (e-GRRT). WAC 173-441-050(8)(h) further requires that a reporter comply with 40 CFR Part 98 when substituting for missing data, except if the reporter is substituting missing data for emissions calculations under Subparts C, H, P, Y and AA of 40 CFR Part 98, in which case the reporter must then comply with specific methods listed under WAC 173-441-050(8)(h)(i). Due to U.S. EPA and Ecology requiring different methods for calculating the same missing data, a reporter can end up with two different emissions estimates. Ecology has not addressed these procedural differences between 40 CFR Part 98.35(b) and WAC 174-441-050(8)(h)(i) for substituting missing data in Subparts C, H, P, Y, and AA.

40 CFR 98.35(b)(1) states “for each missing value of the high heating value, carbon content, or molecular weight of the fuel, **substitute the arithmetic average of the quality-assured values** of that parameter immediately preceding and immediately following the missing data incident.”

40 CFR 98.35(b)(2) states “for missing records of CO₂ concentration, stack gas flow rate, percent moisture, fuel usage, and sorbent usage, **the substitute data value shall be the best available estimate of the parameter**, based on all available process data.”

¹ <https://www.arb.ca.gov/cc/reporting/ghg-rep/guidance/refineries.pdf>

173-441-050 (8)(h)(i)(B) states “If the analytical data capture rate is at least 80 percent but not at least 90 percent for the data year, the person must **substitute for each missing value with the highest quality assured value recorded** for the parameter during the given year, as well as the two previous data years.”

173-441-050 (8)(h)(i) (C) states “If the analytical data capture rate is less than 80 percent for the data year, the person must **substitute for each missing value with the highest quality assured value** recorded for the parameter in all records kept.”

As the rule is currently drafted, for the same missing data, Ecology would cause a facility to report higher emissions under WAC 173-441-050(8)(h). There is no reasonable basis for this, versus what the U.S. EPA has determined is appropriate.

Additionally, the conflict between 40 C.F.R. Part 98 and WAC 173-441 effectively disallows use of U.S. EPA’s e-GGRT system to report emissions under WAC 173-441. Using the WAC 173-441 data substitution scheme would not be compliant with Part 98. WSPA is concerned this rule in effect forces reporting entities to mis-report emissions by having to choose which missing data procedures it should use while submitting data to the federal e-GGRT system.

It is worth noting that California identified this same issue as well as other harmonizing issues while it was developing its MRR and built its own California e-GRRT system as a result to allow for differences in reporting methods to be addressed by reporting entities. Where Ecology’s draft GHG Reporting Rule presents similar issues, Ecology must resolve the discrepancies before adopting this regulation. Accordingly, WSPA urges Ecology to adopt the Federal U.S. EPA procedures in whole for estimating missing data. If Ecology concludes this is not possible, then it must develop its own reporting tool to address differences in the treatment of missing data.

This proposed regulation does not recognize de minimis emissions; the California MRR recognizes de minimis emissions up to three percent (3%), not to exceed 20,000 mt CO₂e. To further align with the MRR, WSPA requests Ecology recognize de minimis emissions and use of engineering calculations to determine the quantity of emissions from the source and not subject them to any accuracy requirements.

WAC 173-441-085 Third-party verification

In (4)(a) Full vs. Less-Intensive Verification, WSPA supports the proposed concept for a “Full Verification (see (a) and (b) every 3 years” and a “less-intensive verification for the remaining two years in the three-year period.” The requirements for a less-intensive verification are detailed in (c). Are we correct to conclude that the only difference between a full- and less-intensive verification is the requirement for a site visit in a full verification as detailed in (b)(ix)?

Further to the above, in (4)(a) Three-year Periods, WSPA also is confused by the stipulation of a “three-year period” for determining verification intensity, when the anticipated Cap-and-Invest program (per the Climate Commitment Act) will likely operate with four-year compliance periods. It would function more consistently if both operated with four-year periods.

In (5)(d), the proposed rule requires regulated parties' correct errors no later than 45 calendar days after discovery of the error or the verification report deadline, whichever is sooner. Rather than forcing a correction in a very short time, WSPA recommends that Ecology require the Verifier finalize its findings at least 4 weeks prior to the verification deadline to provide time for the regulated party to make corrections.

In (7)(b) Eligible third-party verifiers, WSPA recommends that the requirements to change verifiers by every eight years versus the proposed six years, to be more aligned with the proposed four year compliance cycle in the cap and trade program.

In (8), WSPA requests that Ecology clarify if the "Conflict of Interest" requirement will be inclusive of verification services for facilities that are owned by a regulated party in another state, given that California, Oregon, and Washington have now implemented (or propose to implement) TPV requirements.

WAC 173-441-086 Assigned Emissions Level

WSPA requests Ecology specify how it intends to determine an Assigned Emissions Level and place conditions it will use to determine the Assigned Emissions Level within the regulation.

In (3)(b), WSPA requests Ecology clarify if the personnel made available by the owner or operator of the facility can be either employees of the reporting facility or a third-party independent expert to assist ECY in the analysis.

WAC 173-441-110 Fees

WSPA would appreciate clarification that this proposed fee covers only administrative costs for the reporting program, and that any costs for the planned Cap-and-Invest program will be covered separately. As a simplification, WSPA recommends that after the first compliance period, monies collected from the sale of Cap-and-Invest allowances be used to pay for the administrative costs associated with WAC 173-441. WSPA requests early feedback on these items to better understand the complete picture for fees and their magnitude.

WAC 173-441-120 Calculation Methods

In (1) Source categories and calculation methods for facilities, WSPA notes that Table 120-1, which is in the section for facility reporting, deletes Suppliers of Petroleum Products reporting. However, we note that the section for fuel supplier reporting in 173-442-122(5)(d)(x) states that "Owners and operators of petroleum refineries.... must submit a complete refiner report, as defined in 40 CFR Part 90 subpart MM, that includes all products listed in Tables MM-1 and MM-2, as part of their facility report under WAC 173-441-070(1) regardless of the amount of fuel products produced." The resulting discussion of refinery products across sections 070, 120 and 122 may be circular and needs clarity.

WAC 173-441-140 Petitioning Ecology to Use an Alternative Calculation Method

Ecology has identified it may rely on the Solomon CWB calculation for the petroleum refining industry. This approach relies on measuring flows between production units within a refinery. Some facility operators may not have measurement devices which properly account for these flows and rely on alternative approaches to determine the actual flow into and out of production units. WSPA requests Ecology apply the alternative calculation petition process to any refinery production stream used in reporting the CWB for a facility.

As currently proposed, WAC 173-441-140(1) requires an owner or operator to submit a petition to use an alternative calculation method no later than 180 calendar days prior to the report deadline of March 31. By setting the petition deadline 180 calendar days prior to the report deadline of March 31, it forces the reporter to use the missing data substitution procedures of WAC 173-441-150(8)(h)(i) for any missing data identified between the petition deadline and the report deadline. Alternative calculations are an effective, best available approach to quantifying emissions when a data point may not be available. Owners and operators should not be subject to Ecology's missing data substitution procedures if a better, alternative calculation method is available. WSPA requests ECY change the deadline to petition for use of an alternate calculation to January 1 of the data reporting year consistent with California's MRR § 95103(m)(2).

WAC 173-442-122 Calculation Methods for Suppliers

In (2)(c) Definitions: Biomass-derived fuels, the current definition may prove to be too limiting by cross-referencing EPA Table MM-1 and MM-2. Other renewable fuels such as renewable diesel (which is a different fuel versus that in Table MM-2 Biodiesel), renewable naphtha, renewable gasoline, and renewable propane may already be in commerce in Washington or introduced soon. WSPA **strongly recommends** that the following be added to the end of (2)(c): “, **or any other biomass-derived fuel meeting the definition in WAC 173-441-020 (1)(b)**”. It is highly critical that the language defining biofuels is properly flexible, anticipates future renewable fuels, is aligned with biofuels language in the planned Cap-and-Invest, and is aligned with language in the planned Clean Fuels Program. This alignment is important to prevent gaps in treatment of biofuels and to properly incentivize use of biofuels in Washington.

WSPA recommends combining (5)(d)(vi) and (5)(d)(viii) regarding fuel supplier blending of biofuels as this would add clarity.

The requirements in (5)(d)(x) Petroleum Refinery Production are problematic. It is redundant to report all refinery MM-1 and MM-2 products in 120(5)(d)(x) of products in addition to the other fuel supplier reporting already required. It is important to note that some of the products in the refinery report are not combusted and are therefore not necessary to report. We further note that a large fraction of the products that would be reported in this refinery report, for some Washington refineries, may be transported to and consumed in neighboring states. In other words, the refinery report is **misleading** and **disconnected** to actual emissions from fuel combustion within Washington.

The newly proposed reporting by "Suppliers" in Sections 122(5)(d) (i-ix) will paint a much more accurate picture for fuels combusted in Washington, and the resulting GHG emissions. We see no further justification for 173-442-122(5)(d)(x) reporting and recommend it be deleted from Washington reporting.

In (5)(d)(xi) Fuels exempt from Cap-and-Trade obligation, WSPA notes that Section (xi) may still be useful in that it allows fuel suppliers to identify fuels sold in Washington that may be exempt from Cap-and-Trade obligation including Aviation fuels (A), Watercraft fuels combusted outside WA (B) and Agricultural fuels (C).

WSPA appreciates the opportunity to provided comments on this important proposed regulation. If you have any questions regarding this submittal, please contact me at (360) 918-2178 or via email at jspiegel@wspa.org.

Sincerely,

A handwritten signature in blue ink, appearing to read "J Spiegel". The signature is fluid and cursive, with the first letter "J" being particularly large and stylized.

Cc: Neil Caudill - Ecology
Emily Bruns - Ecology