

## Drury, Andrew (DEQ)

---

**From:** Dungey, Curt <Curt.Dungey@Foth.com>  
**Sent:** Friday, July 13, 2018 9:57 AM  
**To:** Drury, Andrew (DEQ)  
**Cc:** Thomas Repaal; Baran, Kris K; Martin, Andrea K; Donohue, Steve; Ahammod, Shamim (DEQ); Lancaster, Edward (DEQ); Carlson, Nicholas (DEQ)  
**Subject:** RE: Copperwood Resources Inc. Air Permit Application 180-11A Information Request #1

Andy:

Foth's e-mail system automatically attaches a confidentiality statement at the end of each message. There is nothing in the message or the emission calculations that is confidential. In the second paragraph of my message below I mention that Copperwood may operate a temporary generator during the first part of mining operations until the power transmission line is in place. Foth has been informed that Copperwood has decided not to utilize a temporary generator and will rely strictly on electric power transmission for operations. Therefore, the revised emission calculations that were included in the message below should accurately reflect planned operations for the mine and you do not need to wait for additional information to complete your review. As stated below, Foth will prepare a summary memorandum that outlines changes to the original application that does not include the natural gas power generators. We will also update any affected tables and figures that include the natural gas power generators. We should have this to you next week.

Let me know if you have further questions.

Thanks

Curtis E. Dungey, CHMM, CIH  
Technical Advisor  
Foth Infrastructure & Environment, LLC  
2121 Innovation Court, Suite 300  
P.O. Box 5126  
De Pere, WI 54115-5126  
Ph: (920) 496-6918 / Fax (920) 496-8516  
Cell: (920) 606-6093  
<http://www.foth.com>

Go Green, keep it on the screen. Please do not print this email unless necessary.

---

**From:** Drury, Andrew (DEQ) [mailto:DRURYA@michigan.gov]  
**Sent:** Thursday, July 12, 2018 10:00 AM  
**To:** Dungey, Curt <Curt.Dungey@Foth.com>  
**Cc:** Thomas Repaal <Thomas.Repaal@highlandcopper.com>; Baran, Kris K <Kris.Baran@Foth.com>; Martin, Andrea K <Andrea.Martin@Foth.com>; Donohue, Steve <Steve.Donohue@Foth.com>; Ahammod, Shamim (DEQ) <AhammodS@michigan.gov>; Lancaster, Edward (DEQ) <LANCASTERE1@michigan.gov>; Carlson, Nicholas (DEQ) <CarlsonN1@michigan.gov>  
**Subject:** RE: Copperwood Resources Inc. Air Permit Application 180-11A Information Request #1

Curt,

Your e-mail contains a confidentiality statement. Please let me know if any information in your e-mail or the revised emission calculations is confidential.

Thank you,

Andrew Drury, Senior Environmental Engineer  
General Manufacturing/Chemical Process Unit  
DEQ-Air Quality Division, Permit Section  
[drurya@michigan.gov](mailto:drurya@michigan.gov)  
Phone number: 517-284-6792

---

**From:** Dungey, Curt <[Curt.Dungey@Foth.com](mailto:Curt.Dungey@Foth.com)>  
**Sent:** Tuesday, July 03, 2018 9:24 AM  
**To:** Drury, Andrew (DEQ) <[DRURYA@michigan.gov](mailto:DRURYA@michigan.gov)>  
**Cc:** Thomas Repaal <[Thomas.Repaal@highlandcopper.com](mailto:Thomas.Repaal@highlandcopper.com)>; Baran, Kris K <[Kris.Baran@Foth.com](mailto:Kris.Baran@Foth.com)>; Martin, Andrea K <[Andrea.Martin@Foth.com](mailto:Andrea.Martin@Foth.com)>; Donohue, Steve <[Steve.Donohue@Foth.com](mailto:Steve.Donohue@Foth.com)>  
**Subject:** RE: Copperwood Resources Inc. Air Permit Application 180-11A Information Request #1

Andy:

Below are responses to your comments of June 1, 2018 on the Copperwood air permit application that was submitted in March 2018. All responses are highlighted in red. As needed, revisions to the air emission calculations have been made. The revised emission calculations are included with this message as a Share File. To facilitate your review of revisions within the spreadsheet, changes are highlighted in yellow. Note that as a result of preparing these responses, air emissions from propane mine heaters and fugitive dust from truck traffic along on-site roadways during transport of reagents and explosives have been added to the emission calculations. Emissions from Process Plant building space heaters are also included. As discussed previously, Copperwood has decided not to provide power to operations through use of an on-site natural gas power plant. It will instead arrange for a power transmission line through a utility. As a result, all air emissions related to the power plant have been removed from the revised air emission calculations. Facility summaries have been updated to reflect the above changes.

Due to the removal of the natural gas power plant, certain sections of the air permit application submitted in March 2018 along with tables and figures will be updated to reflect removal of the power plant from the application. A summary memorandum will be prepared that highlights sections of the text in the application where these changes should be noted as well as updated tables and figures. However, there is a possibility that Copperwood may need to utilize a temporary power generator during the first part of operations until the power transmission line is in place. We hope to learn more about that very soon. Therefore, we will wait to update figures and tables and finalize a summary memorandum until we have this information. As this information is obtained, the emission calculations will be updated to include the temporary power generator.

Please let us know if you have questions or additional comments or you have difficulties opening up the revised emission calculations in the Share File.

Thanks

ShareFile Attachments

Expires August 01, 2018

Copperwood Air Emissions Inventory Ver 2.xlsx

712.7 KB

Download Attachments

Curtis E. Dungey, CHMM, CIH  
Technical Advisor  
Foth Infrastructure & Environment, LLC  
2121 Innovation Court, Suite 300  
P.O. Box 5126  
De Pere, WI 54115-5126  
Ph: (920) 496-6918 / Fax (920) 496-8516  
Cell: (920) 606-6093  
<http://www.foth.com>

Go Green, keep it on the screen. Please do not print this email unless necessary.

---

**From:** Drury, Andrew (DEQ) [<mailto:DRURYA@michigan.gov>]  
**Sent:** Friday, June 01, 2018 9:38 AM  
**To:** Thomas Repaal <[thomas.repaal@highlandcopper.com](mailto:thomas.repaal@highlandcopper.com)>  
**Cc:** Dungey, Curt <[Curt.Dungey@Foth.com](mailto:Curt.Dungey@Foth.com)>; Donohue, Steve <[Steve.Donohue@Foth.com](mailto:Steve.Donohue@Foth.com)>; Baran, Kris K <[Kris.Baran@Foth.com](mailto:Kris.Baran@Foth.com)>; Smith, Cindy (DEQ) <[SMITHC17@michigan.gov](mailto:SMITHC17@michigan.gov)>; Carlson, Nicholas (DEQ) <[CarlsonN1@michigan.gov](mailto:CarlsonN1@michigan.gov)>; Rogers, Michelle (DEQ) <[RogersM13@michigan.gov](mailto:RogersM13@michigan.gov)>; Lancaster, Edward (DEQ) <[LANCASTERE1@michigan.gov](mailto:LANCASTERE1@michigan.gov)>; Ahammod, Shamim (DEQ) <[AhammodS@michigan.gov](mailto:AhammodS@michigan.gov)>; Maki, Joe (DEQ) <[MAKIJ3@michigan.gov](mailto:MAKIJ3@michigan.gov)>  
**Subject:** Copperwood Resources Inc. Air Permit Application 180-11A Information Request #1

Mr. Repaal,

This e-mail is in reference to your Permit to Install application, identified as No. 180-11A, for the proposed copper mining and ore processing facility to be located in Gogebic County, Michigan.

The AQD has reviewed most of the criteria pollutant emission estimates and we have the following comments and questions. The following information is required to ensure that the facility criteria pollutant emissions are completely and accurately estimated.

1. Based on the application, it appears that the PM10 and PM2.5 emission rates exceed the Significant Emission Rates (SERs). Therefore, no permit to install exemptions can be used for the facility and all emission sources at the facility have to be in the permit. Please provide information and emission estimates for building heaters, laboratories, etc. that are discussed on pages 12 and 13 of the application. **Revised emission calculations now indicate that emissions of PM10 and PM2.5 are below the SERs listed in R.336.1119. Therefore, the proposed facility should qualify for the stated exemptions listed in Section 3.4 of the air permit application. This is after addition of air emissions from propane mine heaters and on-site road**

travel during transport of reagents and explosives and removal of the natural gas power plant as discussed further in this response to comments. Nonetheless, air emission estimates are now provided for propane space heaters that will be used in the process plant. Copperwood indicates that laboratory crucible furnaces as described in the permit application will not be installed. Other activities described in Section 3.4 are not expected to produce any significant air emissions.

2. Are there any mine heaters proposed? If so, please provide a description and estimated emissions. Note the emissions from any mine heaters need to be included in the dispersion modeling. While information on mine heaters was not available at the time the air permit application was submitted, information on mine heaters has recently been provided. Mine heaters will discharge through the ventilation raises (SV-001, SV-002, and SV-003). Emission calculations have been updated to reflect this new information and changes are highlighted in yellow.
3. Please provide more information on how emissions from ore transfer points will be enclosed, as discussed on pages 6, 9, and 23; Table 3-3; and in the emission calculations in the application. During operations, all transfer conveyors will have covers. At the conveyor transfer point, the end of the conveyor will discharge to the next conveyor through an enclosure that provides a shroud around the drop point down to the next conveyor. At the ore stockpile, the drop point from the conveyor to the ore stockpile will be enclosed using a discharge chute. At the Ore Bins, each conveyor belt transfer point will be equipped with a discharge chute into the bin to minimize dust emissions. Discharge from the ore bins to ore bin feeders will be enclosed from the bottom of the ore bins to the feeder belt. Similarly, the end of the SAG mill feed conveyor that discharges to the SAG mill hopper will be enclosed to control potential dust emissions. From this point, all ore will be handled in a wet state.
4. In the facility basis tab of the emission calculation spreadsheet, item 3 Particle Size Distribution for Particulate Matter Emissions, why is the PM<sub>2.5</sub> proportion of the total PM (cell F44) two times the PM<sub>2.5</sub> % cumulative size (cell B42)? The value for PM<sub>2.5</sub> in Cell F44 has been changed to 15%, which is the same value in the adjacent column. Revised emission calculations show this change highlighted in yellow.
5. In the underground particulate emission calculations, a settling control efficiency of 95% is applied due to the operations occurring underground. This seems high, especially for PM<sub>2.5</sub>. Please provide the basis for this assumption and revised emission calculations, if needed. A settling efficiency and subsequently a settling factor can be calculated if the dimensions of underground working areas (e.g., stopes, declines, etc.) are known. At the time emission calculations were prepared, this information was not available. Based on previous emission calculations for another underground mine in Michigan, a settling emission factor of 0.43 was calculated for underground stope areas. Given this information, an approximate settling factor of 50% will be applied to this facility. Emission calculations have been revised where this settling factor was applied before and are highlighted in yellow.
6. The underground material handling particulate emission estimates assume a 95% control efficiency for emissions sources enclosed by a cover. Please clarify which emission sources have an enclosed cover. Further review of enclosed cover use underground indicates this will not be practical in combination with wet spray controls. Therefore, reference to enclosed cover underground has been removed from the emission calculations. However, the underground activities will rely on wet sprays at each of the transfer points described. Given it is doubtful the emission source described as “remove broken ore from muck pile” will rely on a wet spray,

this control has been removed for the muck pile. Revised emission calculations reflect these changes.

7. Is any waste rock expected to be produced in the mine? The application briefly mentions waste rock on page 4 in Section 3, on page 22 in Section 5.2.1, and in the TDF wind erosion emission calculations, but there are no emission estimates for waste rock mining. If waste rock will be mined, please provide emission estimates. **Waste rock will not be generated as part of the process. A reference to waste rock in Section 3 was not found. The reference to waste rock in Section 5.2.1 of the application is not correct. In the TDF wind erosion calculations, the description of waste rock being used in the TDF is not correct. Low permeability soil will be used in berm construction for the tailings impoundment. Revised emission calculations have removed this reference in the TDF wind erosion calculations.**
8. In the underground blasting emission calculations, the hourly emission rates are determined by dividing the daily emission rates over 20 hours of operation per day. Will blasting be conducted for 20 hours per day? If not, please provide estimates of the peak hourly pollutant emission rates based on the expected hours per day of blasting. **Blasting will be conducted twice each day, near the end of each of the two work shifts. The blasting process itself is estimated to take less than one hour for each event. Emission calculations have been revised to show the peak emission rate based on one hour.**
9. In the surface ore transfer calculations, does the “Surplus Ore Feed Transfer (using FE) to Feed Ore Conveyor (No.1) (Return from Ore Stockpile)” in cell A21 represent material going from conveyor 4 back to conveyor 1, returning from the stockpile? **The description in Cell A21 occurs at the transfer tower (F001). Material is returned from the ore stockpile using a front end loader (FE) to a surplus ore feed hopper located at the main ore feed conveyor No. 1. This will allow ore to be transferred back into the main circuit and be routed to the ore bins/reclaim area and move onto the process plant.**
10. In the surface ore transfer calculations, does the “From Ore Stockpile footprint back to Surplus Ore Hopper (loading from FE loader)” in cell A31 represent the FEL loading ore to the hopper to go to the conveyor? **The description in Cell A31 is intended to represent the “offloading of the ore handled by the FE loader within the Ore Stockpile footprint.” The description in Cell A32 just below this step is intended to describe the “loading of surplus ore onto the FE loader within the Ore Stockpile footprint for return back to the surplus ore feed hopper at F001.” These descriptions have been re-worded in the emission calculations for more clarity and are highlighted in yellow to represent a change.**
11. In the surface ore transfer calculations, is a 95% control efficiency (for the emission source being indoors or enclosed) appropriate for FEL transfers? Please address each FEL transfer and provide revised emission estimates if necessary. **There are three FE loader transfers described for F002, Surplus Ore Transfer at Ore Stockpile for Temporary Storage. Given there will not be enclosures for these emission points, the 95% control efficiency has been removed. Emission calculations have been updated to reflect this change. Cells where these changes were made are highlighted in yellow in revised emission calculations.**
12. Comparing the ore stockpile material transfer calculations to the surface ore transfer calculations, please explain why AP-42 13.2.4 was used for the ore stockpile calculations while AP-42 11.19-2 was used for the surface ore transfers and provide revised emission estimates if necessary. **For ore handling activities within the ore stockpile footprint (F004), AP-42 13.2.4 was used in that this best represents material handling at storage piles. The set of emission**

factors at AP-42 11.19-2 were used for surface ore transfers in that this best represented material processing activities, including conveyor transfer.

13. Does emission point F002 in the surface ore transfer calculations duplicate emission point F004 in the ore stockpile material handling calculations? If not, please explain the difference. The intent is for F004 to represent all material handling activities within the ore stockpile footprint. This is primarily material handling by the FE loader within that area. Emission point F002 just represents the drop point from conveyor No. 4 from the transfer tower at the main conveyor No. 1 to the immediate ore stockpile area. It also covers the first FE loader handling as the bucket removes material from this intermediate stockpile to the main ore stockpile footprint. All surplus ore at the ore stockpile is returned directly to the surplus ore feed hopper at the transfer tower (F001). (See the depiction of the FE loader return route on Figure 3-2). Originally, material was slated to be returned back through F002 and the surplus ore conveyor. This design was changed to return it directly to the main conveyor system. The second two emission points in F002 still reflect that original handling and should have been eliminated. Given they are duplicative of the ore return process, they have been eliminated from revised emission calculations. In addition, the emission factor for FE loader material handling at F002 has been changed to AP-42 13.2.4, given this better represents material handling within a storage pile, as noted in Item No. 12 above.
14. What is the basis for the 5% moisture content of the ore used in the ore stockpile material handling calculations (cell R18)? Information from the Prefeasibility Study for the project prepared by KD Engineering in July 2011 indicates that the ore moisture content was expected to be 6.5%. Therefore, 5% moisture will be used to be conservative. This documentation has been inserted into the emission calculations and is highlighted in yellow.
15. In the ore stockpile calculations, the vehicle travel calculations reference AP-42 13.2.1, but the calculations appear to be based on AP-42 13.2.2, which would be appropriate for unpaved roads. Please clarify which section of AP-42 was used for the calculations. The reference should be for AP-42 13.2.2 for unpaved roads. This reference was changed in the revised emission calculations and is highlighted in yellow to indicate where the change was made.
16. In the ore stockpile vehicle travel calculations, the estimate circuit length (13,860 feet in cells H63, H64, and H65) does not match the circuit length given in footnote 2 (13,124 feet). Please clarify this and provide revised emission estimates, if necessary. The circuit length was re-evaluated. The one-way distance is only 600 feet one-way. Therefore, the round-trip distance is 1,200 feet. In addition, it is not believed practical to use a watering truck at the ore stockpile. Therefore, the 90% control for use of a watering truck has been removed. Revised emission calculations reflect these changes in the approach to vehicle travel on the ore stockpile. Changes are highlighted in yellow in the revised emission calculations.
17. In the ore stockpile vehicle travel calculations, it looks like the conversion from feet to miles is not correct. It appears, in cells L63, L64, and L65, that a conversion factor of 8,760 feet per mile was used rather than 5,280 feet per mile. Please address this and provide revised emission estimates, if necessary. Emission calculations were reviewed and the conversion factor was changed from 8,760 to 5,280 feet per mile. Revised emission calculations reflect this change.
18. In the access truck travel calculations, only the concentrate and water trucks are included. Trucks used to deliver reagents and explosives should be included as well, since, based on expected usage rates, these trucks could represent a significant portion of the total

truck traffic. Please evaluate the number of other types of trucks and provide additional emission calculations for them, if warranted. Usage rates for delivery of explosives, reagents, and grinding mill media were obtained from GMining and Copperwood. This information was used to prepare estimates of truck travel required along the access road to the mine facility. Air emissions due to truck travel for these activities were added to the emission calculations and are highlighted in yellow. To be conservative, hourly emission rates are now based on actual time spent on access roadways as opposed to using the maximum hours for process plant operations. These changes are also highlighted in yellow.

19. Please provide further discussion regarding the assumption that the particle size ratios for the ore storage pile will be the same as for the tailings in the TDF, since the tailings have a much higher silt content (92.42%) than the ore (2%). Using the Particle Size Distribution graphs for rougher and first cleaner scavenger tails, the particle size ratios were adjusted for the TDF. Per information from Copperwood, 61% of the tailings will be rougher tails and 39% will be first cleaner scavenger tails. Weighted average particle size ratios were calculated from this information for 10 and 2.5 micron particle sizes for the TDF and used in calculated overall emissions from wind erosion. Emission calculations for wind erosion have been updated to reflect this information and changes are highlighted in yellow.
20. In the natural gas power plant calculations, are the manufacturer emission factors based on kW output for the engines or the input? The calculations apply the emission factors to the output. If the emission factors are based on the kW input, please provide revised emission estimates. Copperwood has decided to not use natural gas power generators and will instead rely on electrical power. Therefore, power generator engines will not be used and have been removed from revised emission calculations.
21. For the natural gas power plant, the AP-42 emission factors appear to be applied to the Btu output from the engines. However, the AP-42 emission factors are based on the heat input to the engines. Looking at the heat rate in kJ/kWh and the electrical efficiency on page 15 of the engine manufacturer data in Appendix A-1, the heat input for each engine appears to be about 41 MM Btu/hr, rather than 19 MM Btu/hr. Please re-evaluate the engine emission calculations and provide revised calculations if necessary. Copperwood has decided to not use natural gas power generators and will instead rely on electrical power. Therefore, power generator engines will not be used and have been removed from revised emission calculations.
22. For the natural gas generator engines, does the manufacturer have formaldehyde emission data? Copperwood has decided to not use natural gas power generators and will instead rely on electrical power. Therefore, power generator engines will not be used and have been removed from revised emission calculations.
23. In the natural gas power plant calculations, the following toxic air contaminants appear to be HAPs but are not marked that way: xylene, 1,1 dichloroethane, 1,2 dichloropropane, chloroethane, toluene, and vinyl chloride. The emissions of these compounds are low and will not make the facility a major HAP source, but the application should accurately reflect the HAP emissions. Copperwood has decided to not use natural gas power generators and will instead rely on electrical power. Therefore, power generator engines will not be used and have been removed from revised emission calculations.
24. In the natural gas power plant calculations, should row 60 be benzo(e)pyrene with an emission factor of 4.15E-7 rather than benzo(a) pyrene with an emission factor of 4.50E-7? Copperwood has decided to not use natural gas power generators and will instead rely on

electrical power. Therefore, power generator engines will not be used and have been removed from revised emission calculations.

25. Does Copperwood know if ammonia or urea will be used in the SCR systems on the engines? Copperwood has decided to not use natural gas power generators and will instead rely on electrical power. Therefore, power generator engines will not be used and have been removed from revised emission calculations.
26. Will the natural gas power plant have any continuous emission monitors? Will there be emission monitors to ensure the control equipment is working correctly? Copperwood has decided to not use natural gas power generators and will instead rely on electrical power. Therefore, power generator engines will not be used and have been removed from revised emission calculations.
27. For the emergency generator engines, are the manufacturer's g/hp-hr emission factors based on the power output or the power input? Please review the calculations and provide revised emission estimates if necessary. The manufacturer's g/hp-hr emission factors are based on power output. These were used to calculate emissions for NO<sub>x</sub>, CO, VOC, and PM. For SO<sub>2</sub>, the power output emission factor in lb/hp-hr from Table 3.4-1 in AP-42 for large stationary diesel engines was used. To estimate organic compound emissions, the emission factors in Tables 3.4-3 and 3.4-4 were used. According to AP-42, there is not enough information to calculate the output specific emission factors in lb/hp-hr. While these emission factors are expressed in lb/mmBTU for fuel input, emissions in lb/hr were estimated by using the maximum fuel consumption in full standby mode and the heating value of diesel at 137,000 BTU/gal.
28. For the emergency generator engines, should the horsepower given on the manufacturer's specification sheet, corresponding to the chosen emission factor, be used to estimate the emissions, rather than the horsepower calculated from the kW rating of the unit (732 hp vs. 670 hp for the 500 kW engines and 1482 hp vs. 1341 hp for the 1000 kW engine)? Please provide revised emission estimates if necessary. Rather than use the horsepower calculated from the kW rating, we will use the full standby horsepower rating on each of the specification sheets. For the 500 kW engine, 732 hp will be used; while 1482 hp will be used for the 1000 kW engine. Changes have been made in the revised emission calculations and are highlighted in yellow.
29. In the reagent emission calculations, the consumption of "flocculant (To be determined)" is given as 1.1 ton/year, which seems quite low. Please investigate the estimated consumption of this material and provide a revised value, if necessary. Note the amount of this material used could affect the vehicle traffic emission calculations, depending on how many deliveries of this material would be required. Based on discussions with Copperwood, flocculant use will be minimal, if not eliminated completely. It may be used occasionally in the concentrate thickener, but otherwise use would not occur. Therefore, the 1.1 ton/year rate should still be correct.
30. Based on the reagent calculations use of the AP-42 11.12-2 "Cement supplement unloading to elevated storage silo (pneumatic) (controlled E.F.)" emission factor, it appears there will be a lime storage silo. Please confirm if there will be a silo and, if so, what type of control it will have, such as a bin vent filter. According to information provided by Copperwood, all hydrated lime will arrive in sacks, bulk tote bags, or some other container. It will not be delivered by truck and offloaded to a storage silo. The emission calculations have been revised to reflect

this and references to lime silo with bin vent have been removed. All deliveries of hydrated lime will occur inside the reagent building.

31. For the dry reagent handling calculations, except as noted below, the PM10 and PM2.5 emission factors are the same and the PM2.5 emissions are assumed to be 35% of the PM10 emissions in column I. What is the basis for this assumption? It does not seem to match the information on the facility basis sheet. Given it is assumed the PM10 and PM2.5 emission factors are the same for reagent handling, the PM2.5 emissions in column I have been changed to be the same as PM10 in column H. The reference to footnote 4 and footnote 4 have been removed in that the facility basis assumptions for aggregate handling are not being relied upon for reagent handling. Updated information is provided in the revised emission calculations with changes highlighted in yellow.
32. For the lime silo filling calculation in row 42, the PM2.5 emission factor is assumed to be 30% of the PM10 factor in column E. However, in column I (the PM2.5 calculation), the PM2.5 emissions are assumed to be 35% of the PM10. Please clarify what percentage (30% or 35%) of the PM10 is PM2.5 and provide the basis for the percentage. Per the response to Item No. 31 above, for the reagents, it will be assumed the PM10 and PM2.5 emission factors are the same; therefore, calculated emissions for PM10 and PM2.5 should be the same. Emission calculations and references have been updated to reflect this.
33. The reagent emission summary lists two materials (the flocculant and anti-scalant) as "To be determined". Have these materials been selected yet? If so, please provide SDS or other information for them. As noted in the response to Item No. 29 above, flocculent use at the facility will be minimal or eliminated completely. According to the latest information from Copperwood, selection of specific products for flocculent and anti-scalant have still not been determined. Once these materials have been selected, Safety Data Sheets can be provided.
34. For the NDM emission calculation, please verify the density used in cell I67. The value in the cell (67.1) does not match the calculated density in row 65 (7.1 lb/gallon). The density in Cell I67 should be 7.1 lb/gallon. Revised emission calculations have been updated to reflect this value with changed cells highlighted in yellow.
35. The liquid reagent emission calculations assume there are 31.5 gallons in a barrel. Please verify this, as we typically see applicants use 42 gallons per barrel, especially in relation to AP-42 Section 7.1 and petroleum products. The gallons per barrel has been changed to 42 gallons per barrel for both MIBC and NDM to reflect what is typically seen for barrel sizes.
36. We have not evaluated the GHG calculations in detail yet. However, it looks like the natural gas power plant calculations are based on the energy output of the engines (19 MM Btu/hr) rather than the energy input of the engines, which may be around 41 MM Btu/hr, as mentioned in number 21 above. Please review these calculations and verify that the GHG emissions are estimated based on the expected fuel usage. The natural gas power plant will not be constructed and information on this emission unit will be removed from the revised emission calculations.
37. The dispersion modeling for the natural gas power plant engines is based on the emissions from four engines divided over the five stacks. This approach may be acceptable for pollutants with annual averaging times, but is not appropriate for pollutants with shorter averaging times. For the shorter averaging time pollutants, the emissions should be modeled from the four stacks that result in the highest modeled impacts in order to evaluate the worst case

operating scenario. **The natural gas power plant will not be constructed and information on this emission unit will be removed from the revised emission calculations.**

Please provide the information requested above as soon as possible. We would appreciate a response by June 22, 2018.

As we continue our review of your application, and based on your responses to these questions, additional information may be needed and we may have additional questions.

Note, any changes to the emission estimates will require the dispersion modeling to be updated to reflect the changes. We are not asking you to revise any modeling at this point, if revised modeling will be needed, as further review of your application and/or review of your responses to these questions may result in additional changes to the emission estimates which would have to be incorporated into the dispersion modeling.

We will continue our review of your application and provide any additional questions as soon as we can.

Please contact me if you have any questions.

Thank you,

Andrew Drury, Senior Environmental Engineer  
General Manufacturing/Chemical Process Unit  
DEQ-Air Quality Division, Permit Section  
[drurya@michigan.gov](mailto:drurya@michigan.gov)  
Phone number: 517-284-6792

---

#### IMPORTANT NOTICE

This communication including any attachments, (E-mail) is confidential and may be proprietary, privileged or otherwise protected from disclosure. If you are not the intended recipient, please notify the sender, permanently delete this E-Mail from your system and destroy any copies. Any use of this E-Mail, including disclosure, distribution or replication, by someone other than its intended recipient is prohibited.

This E-Mail has the potential to have been altered or corrupted due to transmission or conversion. It may not be appropriate to rely upon this E-Mail in the same manner as hardcopy materials bearing the author's original signature or seal.