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October 22, 2012

Mr. Gary Victorine, Chief
U.S. Environmental Protection Agency, Region 5
RCRA Branch (LR-8J)
77 West Jackson Boulevard
Chicago, IL 60604

RE: Draft Federal RCRA Permit, Essroc Cement Corporation
Logansport, Indiana, IND 005 081 542
Comments to Draft RCRA Permit, Risk Assessment

Dear Mr. Victorine:

Essroc Cement Company (Essroc) is submitting this letter to provide comments on the draft Federal RCRA permit referenced above provided to Essroc on July 22, 2012. Essroc requested, and was granted an extension to the comment period, which allows for comments until October 23, 2012. Enclosed are proposed changes to the permit in order to modify the language of the permit conditions prior to formal publication. These changes center around the proposed mercury limit. Essroc proposes to change this limit from 87.91 pounds per year to 896.7 pounds per year. In addition, Essroc has provided comments on the permit conditions support documentation, specifically the facility risk assessment performed by USEPA Region 5.

If you should have any questions, please contact me at (574) 739-6147. Thank you in advance for your attention to this matter. We look forward to concluding this permitting effort in the near future.

Sincerely,
ESSROC CEMENT COMPANY

Jeremy Black
Plant Manager

Encl.
cc: Jae Lee, Permit Writer, USEPA

ESSROC – LOGANSPORT
COMMENTS TO DRAFT PART B PERMIT CONDITIONS

Mercury Feed Rate Limit

Current Draft Permit Language:

III.F.1 You shall comply with the annual feed rate limit for the compound specified below (yearly total both Kiln #1 and Kiln #2, combined):

Compound	Annual Feed Limit
Mercury	87.91 pounds (lb) per year

Proposed Permit Language:

IIIF.1 You shall comply with the annual feed rate limit for the compound specified below (yearly total both Kiln #1 and Kiln #2, combined):

Compound	Annual Feed Limit
Mercury	896.7 pounds (lb) per year

Reasoning for Request Change:

Based on the analysis performed by Essroc utilizing accepted risk assessment guidelines and factors as detailed in the calculations presented in Attachments 1 and 2, Essroc concludes that no additional feed rate limit is needed to protect human health and the environment beyond those already provided in 40 CFR Part 63, Subpart EEE (HWC MACT standard).

However, Essroc understands the need to reduce mercury emissions to the environment. Essroc is therefore proposing an emission limit that is below the HWC MACT standard and the revised risk assessment feed limit. The revised acceptable mercury feed rate limit from the risk assessment is 2,131.98 lbs/yr and the calculated HWC MACT feed rate limit for the two kiln operation is 1,793.4 lbs/yr. Therefore, in the above proposed language Essroc is proposing a facility limit that is approximately half of the HWC MACT and revised acceptable risk assessment limits.

Kiln # 2 System Removal Efficiency Testing

Current Draft Permit Language:

III.F.3 You must conduct a test to determine the removal efficiency of the mercury compound at Kiln #2. Such testing must be conducted before or during the next performance or compliance test required at the facility by the State or federal agencies. At least 90 days prior to conducting the removal efficiency test at Kiln #2, as required in this paragraph, you must submit a test plan, including, but not limited to, a waste analysis plan, a quality assurance project plan, and a scope of procedures for the laboratories to EPA for approval. Based on the results of the removal efficiency test, EPA may recalculate and revise the mercury annual feed rate limit provided in this permit using the new System Removal Efficiency.

Proposed Permit Language:

None – Eliminate Section III.F.3

Reasoning for Requested Change:

Based on the analysis provided in Attachments 1 and 2 of this response, no additional mercury limit is necessary beyond that provided in the HWC MACT standard. The inclusion of additional testing to determine a Kiln #2 mercury SRE will not alter this conclusion. Additionally, with the self imposed limit presented in the proposed comment for condition III.F.1, Essroc has provided additional reductions in the potential mercury emissions.

ESSROC – LOGANSPORT
COMMENTS TO DRAFT PART B PERMIT
RISK ASSESSMENT

ATTACHMENT 1

ESSROC – LOGANSPORT
COMMENTS TO DRAFT PART B PERMIT
RISK ASSESSMENT

Bioaccumulation Factor for Methymercury in Fish

The U.S. EPA 2005 Human Health Risk Assessment Protocol (HHRAP) recommends a methylmercury bioaccumulation factor (BAF) of 6.8E+06 L/kg for Trophic Level 4 fish, which is based on the BAF used in the U.S. EPA 1997 *Mercury Study Report to Congress* for Trophic Level 4 fish. EPA Region 5 averaged this BAF and the BAF recommended for Trophic Level 3 fish, resulting in a BAF of 4.05E+06 L/kg, to represent a mixture of Trophic Level 3 and 4 fish being taken from the lakes at France Park for the risk analysis. Essroc believes using an average BAF to represent a mixture of large and small fish is appropriate. However, as previously provided to Region 5, more recent guidance on appropriate BAF values is available from the U.S. EPA. The U.S. EPA January 2009 *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*[1] recommends a Trophic Level 4 BAF of 2.7E+06 L/kg and a Trophic Level 3 BAF of 6.8E+05 L/kg. Averaging these two BAFs to represent the appropriate fish Trophic Level results in a BAF of 1.69E+06 L/kg.

U.S. EPA has used a wide range of BAFs to estimate the fate and transport of methylmercury in fish. For example, U.S. EPA selected a bioaccumulation factor of 1.6E+06 in the *Utility Steam Report to Congress* for Trophic Level 4 fish. BAF values of 1.6E+06 and 6.8E+06 were both used in the risk assessment conducted for the HWC MACT rule. Essroc believes the BAF of 1.69E+06 L/kg is more representative of the lake conditions at France Park, is based on more recent U.S. EPA guidance, and should be used for the analysis. Using this more representative and appropriate BAF value reduces the estimated HQ by 58%. The relationship between the BAF and resulting HQ value is linear. Therefore by using the revised HQ based on the lower BAF, the calculated mercury annual feed rate (MAF) is 211.49 pounds of mercury per year. Detailed calculations supporting this conclusion are provided in Attachment 2 of this document.

[1] Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, April 2010. EPA-823/R-10-001.

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Fish Consumption Rate

France Park consists of two small lakes, Elzbeck Lake and Old Kenith Stone Quarry. Elzbeck Lake is open to fishing all year. Old Kenith Stone Quarry, however, is closed to fishing from Labor Day to Memorial Day (approximate dates, actual dates are dependent upon weather and lifeguard availability) when the lake is used for recreational sunbathing and swimming. During the winter months, the lakes are known to freeze over, requiring ice fishing to harvest fish for consumption. Ice fishing does not typically produce the subsistence catch level due to the substantially decreased activity of the fish. After research and discussions with a fisheries biologist in Indiana,[2] it is unclear if these small lakes could support subsistence fishing, which generally occurs on much larger water bodies. The subsistence fishing scenario is typically considered for much larger water bodies, such as the Columbia River as cited in the HWC MACT rule development documentation.[3]

There are different ways to address the issue of the lakes' ability to support subsistence fishing.

Option 1

One way would be to evaluate the lakes under a recreational fisher type scenario, since the lakes can and do support recreational fishing. To evaluate a Recreational Fisher scenario, a modified fish consumption rate of one meal per week would be used versus the HHRAP default of 12 meals per month. The modified consumption rate is based on typical fish consumption advisory guidelines, which generally recommend that women of child-bearing age not consume more than one meal per week of fish. (The mercury Reference Dose is based on protecting the fetus and infants from neurological health effects.) In evaluating these two lakes for recreational fishing, an adult fish ingestion rate of 21.4 gram/day (fresh weight) for adults would be used. The 21.4 grams/day was derived from the U.S. EPA *Mercury Study Report to Congress* in which 140 grams/day was cited as being equivalent to 340 meals/year. This equivalency results in 150.29 grams of fish per meal. Thus, 21.4 grams/day is computed as follows:

1 meal/week × 52 weeks/year × 1 yr/365 days × 150.29 grams/meal = 21.4 grams/day

For a 70 kg adult, the 21.4 gram/day ingestion rate corresponds to a per body weight value of 0.00031 kg/kg-day. The child fish ingestion rate of 0.00022 kg/kg-day would then be derived by applying the ratio of HHRAP child ingesting rate of 0.00088 kg/kg-day to HHRAP adult ingestion rate of 0.00125 kg/kg-day, to the recreational fisher adult fish ingestion rate of 0.00031 kg/kg-day. Utilizing these consumption rates in the risk

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[2] Phone conversations with Mr. Tom Stefanavage; Indiana's State Big Rivers Fisheries Biologist (812-789-2724).
[3] U.S. EPA (1999) *Human Health and Ecological Risk Assessment Support to the Development of Technical Standards for Emissions from Combustion Units Burning Hazardous Waste Response to Public Comment.* Office of Solid Waste.

analysis, this is consistent with the recreational fisher scenario and results in a 75% reduction in the estimated HQ. The relationship between the consumption rate of contaminated fish and resulting HQ value is linear. Therefore by using the revised HQ based on the lower fraction of contaminated fish consumed; the calculated MAF is 354.49 pounds of mercury per year. Detailed calculations supporting this conclusion are provided in Attachment 2 of this document.

Option 2

Another possible way to address the ability of the lakes to support a subsistence fishing scenario is to reduce the percentage of contaminated fish consumed. This type of scenario modification would account for a portion of the fish being consumed by a subsistence fisher coming from France Park (i.e., the amount of contaminated fish) while recognizing that a portion would also come from other water bodies (i.e., the amount of uncontaminated fish). Setting the fraction of contaminated fish consumed to 0.5 results in a decrease of 50% in the estimated HQ. The relationship between the consumption rate of contaminated fish and resulting HQ value is linear. Therefore by using the revised HQ based on the lower fraction of contaminated fish consumed; the calculated MAF is 175.83 pounds of mercury per year. Detailed calculations supporting this conclusion are provided in Attachment 2 of this document.

ESSROC believes either of the above scenario modifications are valid approaches for the risk analysis rather than the subsistence fisher scenario for France Park Lake. If EPA believes the subsistence fisher scenario is necessary, Essroc believes a larger body of water that could obviously support subsistence fishing should be used for the analysis.

Methylation Rate of Mercury

The U.S. EPA Mercury Report to Congress[4] reported methylation values of mercury in deep water lakes vary from 4.6% up to 15%. The U.S. EPA relied on this information in the HHRAP guidance for the default methylation rate of 15%. In previous risk assessments for the Logansport facility, a mercury methylation rate of 6% has been used versus the HHRAP default of 15% in evaluating the fisher scenarios for the Wabash and Eel Rivers. [5] Given that the two water bodies at France Park are not "deep water lakes" like those in the Report, but are shallow, spring-fed lakes, ESSROC believes a more realistic mercury methylation rate should be used for the risk analysis. Considering that the shallow, spring-fed lakes are more like rivers than deep water lakes, the rate previously used for rivers could be used as a more realistic measure of the mercury methylation rate in the lakes at France Park. Using this more representative and realistic mercury methylation rate reduces the estimated HQ by 60%. The relationship between the methylation rate of mercury and resulting HQ value is linear. Therefore by using the revised HQ based on the lower methylation rate, the calculated MAF is 219.79 pounds of mercury per year. Detailed calculations supporting this conclusion are provided in Attachment 2 of this document.

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[4] U.S. EPA (1997) *Mercury Study Report to Congress. Volume III: Fate and Transport of Mercury in the Environment* (EPA-452/R-97-005). Office of Air quality Planning and Standards; Office of Solid Waste.

[5] U.S. EPA Region 5 Waste Management Branch correspondence from Mario Mangino, Toxicologist, to Jae Lee. June 27, 2003.

ESSROC – LOGANSPORT
COMMENTS TO DRAFT PART B PERMIT
RISK ASSESSMENT
CALCUALTION SUPPORT

ATTACHMENT 2

ESSROC – LOGANSPORT
COMMENTS TO DRAFT PART B PERMIT
RISK ASSESSMENT
CALCUALTION SUPPORT

Bioaccumulation Factor for Methymercury in Fish

BAF used by EPA: 4.05E+06 L/kg
BAF requested by Essroc: 1.69E+06 L/kg

The relationship between the HQ calculated for emission of mercury and BAF is linear.

$$\frac{\text{EPA BAF}}{\text{EPA HQ}} = \frac{\text{Essroc BAF}}{\text{Essroc HQ}}$$

$$\frac{4.05\text{E+06 L/kg}}{2.55} = \frac{1.69\text{E+06 L/kg}}{\text{Essroc HQ}}$$

$$1.06 = \text{Essroc HQ}$$

Using the equation to calculate the annual mercury feed limit as presented in the June 28, 2012 memo from Jae Lee to file and included in the draft Essroc Federal RCRA Permit:

MAF*(1-SRE)*HIPEM*(1/8760) = 0.25

MAF = Annual feed rate of mercury

SRE = System removal efficiency for mercury = 69.84%

HIPEM = HQ value per g/hr mercury emission rate

14.004 g/hr = HWC MACT mercury emission rate (standard based on Essroc stack conditions)

8760 = hours per year

0.25 = HQ risk value noted as acceptable by EPA

453.59 = grams per pound

MAF = 0.25 / [(1-.6984) * (1.06/14.004 g/hr) * (1/8760) * 453.59] = 211.49 pounds Hg /yr

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CALCUALTION SUPPORT

Fish Consumption Rate – Option 1

Fish consumed by adult subsistence fisher - used by EPA: 0.00125 kg/kg-day
Fish consumed by adult recreational fisher - used by Essroc: 0.00031 kg/kg-day

The relationship between the HQ calculated for emission of mercury and consumption of contaminated fish is linear.

$$\frac{\text{EPA consumption}}{\text{EPA HQ}} = \frac{\text{Essroc consumption}}{\text{Essroc HQ}}$$

$$\frac{0.00125 \text{ kg/kg-day}}{2.55} = \frac{0.00031 \text{ kg/kg-day}}{\text{Essroc HQ}}$$

$$0.6324 = \text{Essroc HQ}$$

Using the equation to calculate the annual mercury feed limit as presented in the June 28, 2012 memo from Jae Lee to file and included in the draft Essroc Federal RCRA Permit:

MAF*(1-SRE)*HIPEM*(1/8760) = 0.25

MAF = Annual feed rate of mercury

SRE = System removal efficiency for mercury = 69.84%

HIPEM = HQ value per g/hr mercury emission rate

14.004 g/hr = HWC MACT mercury emission rate (standard based on Essroc stack conditions)

8760 = hours per year

0.25 = HQ risk value noted as acceptable by EPA

453.59 = grams per pound

MAF = 0.25 / [(1-.6984) * (0.6324/14.004 g/hr) * (1/8760) * 453.59] = 354.49 pounds Hg /yr

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Fish Consumption Rate – Option 2

Fraction of consumed fish contaminated used by EPA: 1.0
Fraction of consumed fish contaminated used by Essroc: 0.5

The relationship between the HQ calculated for emission of mercury and consumption of contaminated fish is linear.

$$\frac{\text{EPA consumption}}{\text{EPA HQ}} = \frac{\text{Essroc consumption}}{\text{Essroc HQ}}$$

$$\frac{1.0}{2.55} = \frac{0.5}{\text{Essroc HQ}}$$

$$1.275 = \text{Essroc HQ}$$

Using the equation to calculate the annual mercury feed limit as presented in the June 28, 2012 memo from Jae Lee to file and included in the draft Essroc Federal RCRA Permit:

MAF*(1-SRE)*HIPEM*(1/8760) = 0.25

MAF = Annual feed rate of mercury

SRE = System removal efficiency for mercury = 69.84%

HIPEM = HQ value per g/hr mercury emission rate

14.004 g/hr = HWC MACT mercury emission rate (standard based on Essroc stack conditions)

8760 = hours per year

0.25 = HQ risk value noted as acceptable by EPA

453.59 = grams per pound

MAF = 0.25 / [(1-.6984) * (1.275/14.004 g/hr) * (1/8760) * 453.59] = 175.83 pounds Hg /yr

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Methylation Rate of Mercury

Methylation rate of mercury used by EPA: 15%
Methylation rate of mercury used by Essroc: 6%

The relationship between the HQ calculated for emission of mercury and the methylation rate of mercury is linear.

EPA methylation %		Essroc methylation %
EPA HQ	=	Essroc HQ

15%		6%
2.55	=	Essroc HQ
1.02	=	Essroc HQ

Using the equation to calculate the annual mercury feed limit as presented in the June 28, 2012 memo from Jae Lee to file and included in the draft Essroc Federal RCRA Permit:

MAF*(1-SRE)*HIPEM*(1/8760) = 0.25

MAF = Annual feed rate of mercury

SRE = System removal efficiency for mercury = 69.84%

HIPEM = HQ value per g/hr mercury emission rate

14.004 g/hr = HWC MACT mercury emission rate (standard based on Essroc stack conditions)

8760 = hours per year

0.25 = HQ risk value noted as acceptable by EPA

453.59 = grams per pound

MAF = 0.25 / [(1-.6984) * (1.02/14.004 g/hr) * (1/8760) * 453.59] = 219.79 pounds Hg /yr

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When combined, the modified BAF value, fish consumption value (Option 1) and methylation rate would result in an overall reduction of the calculated HQ for mercury emissions by 95.8%. Revision of the BAF value results in a 58% reduction in the HQ. Appling the recreational fisher consumption rate results in *another* 75% reduction in the HQ value. Finally applying the lower methylation rate produces *an additional* 60% reduction in the HQ value. Because of the linear relationship between calculated HQ and acceptable emission rate, the MAF increases to 2,131 pounds of mercury feed per year. This is above the corresponding input rate[6] allowed by the HWC MACT emission limits. Therefore, the HWC MACT regulations are sufficient to protect human health and the environment and additional mercury input limits are not necessary.

Again the equation to calculate the annual mercury feed limit as presented in the June 28, 2012 memo from Jae Lee to file was used to calculate an annual mercury feed limit:

MAF*(1-SRE)*HIPEM*(1/8760) = 0.25

Results are summarized in the table below.

Adjustment of Value	Affect on HQ		Resulting HQ	Resulting HIPEM	Resulting Hg Feed Rate Adjustment (lb/yr)	Resulting Hg Feed Limit Cumulative (lb/yr)
EPA Calculated	--		2.55	0.182091	--	87.91
HWC MACT	--		--	--	--	1793.4
Revision of BAF	58%	reduction	1.06	0.075693	211.49	211.49
Revision of Consumption	75%	reduction	0.26	0.018772	641.30	852.79
Revision of Methylation Rate	60%	reduction	0.11	0.007509	1067.70	2131.98

[6] Based on HWC MACT mercury emission limits, facility stack characteristics and a 69.84% SRE, the input limit is 1793.4 pounds of mercury per year.