



Flat Rolled Products

Trentwood Works

September 13, 2016

Mr. Patrick Hallinan
Department of Ecology
4601 N Monroe Street
Spokane, WA 909205

Re: Kaiser Aluminum Washington, LLC
NPDES Permit No. WA0000892
Comments on Draft Renewal Permit (June 30, 2016)

Dear Mr. Hallinan:

Kaiser Aluminum Washington LLC respectfully submits these comments on Draft NPDES Permit No. WA0000892 to identify issues Ecology should address before issuing the final permit. Our comments cover PCB, nutrients, temperature, critical flow, intake structure, fact sheet, and general issues.

As is discussed in detail below, the most significant issue with the draft permit is Ecology's improper inclusion of water quality-based effluent limits ("WQBELs") for PCBs. Ecology failed to consider all relevant data and did not perform an accurate analysis of the reasonable potential for Kaiser's discharge to contribute to an exceedance of water quality standards. WQBELs may be established only when a discharge has the reasonable potential to cause a violation of water quality standards. See 40 C.F.R. 122.44(d)(1)(i)-(iii). Ecology's own guidance directs permit writers to consider the characteristics of the receiving waterbody, including the background concentration of the target contaminant, to determine whether there is a reasonable potential for the discharge to contribute to an exceedance of the applicable standard. Ecology, "Water Quality Program Permit Writer's Manual" (Publication No. 92-109, January 2015), at 251. Despite this directive, Ecology ignored data that show: (1) the Spokane River does not exceed water quality standards for PCBs; and (2) there is no reasonable potential that Kaiser's discharge will contribute to an exceedance. There is therefore no justifiable basis for the PCB WQBELs in Draft Permit No. WA0000892.

In addition, Ecology's inclusion of WQBELs is unnecessary and conflicts with the United States Environmental Protection Agency's July 13, 2015 position regarding permits for dischargers to the Spokane River. EPA stated that WQBELs should not be included in permits issued to Spokane River dischargers and that best management practices ("BMPs") "will be more effective in reducing discharges of PCBs than numeric effluent limits." Kaiser already operates a state-of-the-art treatment system that provides a high level of treatment of effluent before discharge to the river and has implemented BMPs that are highly effective.

In the Fact Sheet for draft Permit No. WA0000892, Ecology acknowledges the PCB reductions achieved by Kaiser in the current permit cycle, and Kaiser looks forward to continuing its cooperation with Ecology and with the Spokane River Regional Toxics Task Force (“Task Force”) to achieve further reductions.

Through its participation in the Task Force and separately under supervision of Ecology’s Toxics Cleanup Program, Kaiser has worked to identify and remove potential sources of PCBs to the Spokane River. Kaiser has removed PCB-contaminated soil and sludge from the Trentwood property, capped PCB-contaminated sediment in the Spokane River, and completed several sewer cleanout projects. Kaiser has consistently cooperated with Ecology to sample its discharge and the Spokane River for PCBs and to effectively and efficiently identify and reduce potential sources.

Instead of arbitrarily including WQBELs in the permit, Ecology should adopt the approach taken by the Delaware River Basin Commission (“DRBC”), which has been accepted by EPA headquarters, two EPA regions, and four states for incorporation into approximately 100 NPDES permits. Under this approach, a point source permit includes an “action level” discharge level as the baseline for PCB source reduction activities. Throughout the permit cycle, each permittee follows a discharge reduction plan, and performance is tracked to evaluate the effectiveness of reduction activities. Finally, the next permit includes a new action level that reflects achieved reductions. This DRBC approach should be implemented to reduce PCB discharges to the Spokane River.

Also, as discussed below, the draft permit contains a number of additional provisions that similarly are improper.

I. PCB Related Comments

Ecology has ignored EPA’s position against PCB water quality-based effluent limitations.

In response to the court’s order in *Sierra Club v. McLerran*, No. 11-cv-1759-BJR, EPA provided its views “to help Ecology establish enforceable and defensible permit conditions that can reasonably be expected to result in reductions of [PCB] loadings to the Spokane River and the Little Spokane River from regulated point sources.” See Appendix A. Specifically, EPA advised Ecology to utilize BMPs to control and abate PCB discharges from point sources because BMPs will be “more effective” than WQBELs. In addition to advising Ecology, EPA, as the permit authority in Idaho, included BMPs, and not WQBELs, in permits for point sources discharging into the Spokane River just a few miles upriver from Kaiser’s facility.

EPA’s position realistically acknowledges the limitations of current testing methods. Any water quality-based effluent limit for the Spokane River, including the limits proposed in Draft NPDES Permit No. WA0000892, would be orders of magnitude lower than the lowest concentration quantifiable by analytical methods approved to measure permit compliance under 40 C.F.R. Part 136.

Ecology has not provided any justification for the proposed WQBELs for PCBs included in Draft Permit No. WA0000892. Ecology should remove PCB WQBELs from the permit in favor of the EPA-recommended BMP based approach.

Ecology has not followed the steps required to set WQBELs.

Before establishing WQBELs, Ecology must perform a defensible reasonable potential analysis to determine if Kaiser's discharge will contribute to an exceedance of applicable water quality standards. See 40 C.F.R. 122.44(d)(1)(i)-(iii). The analysis must consider whether the receiving waterbody exceeds water quality standards. As explained below, Ecology has ignored data that show the Spokane River does not exceed water quality standards for PCBs, inconsistently blank censored data, and improperly considered fish tissue data to evaluate current conditions in the water column.

WQBELs are appropriate only after development of a TMDL, an assessment that takes into account point and non-point sources. Without following the required steps to accurately evaluate current water column conditions, develop a TMDL (only if necessary to attain water quality standards), and assign allocations across all sources, Ecology has arbitrarily established PCB WQBELs for only three point sources to the Spokane River.

This arbitrary decision to place the entire burden of reducing PCB loads to the Spokane River on only three point sources ignores significant contributions from groundwater and other sources. This is inconsistent with past analyses performed by Ecology that demonstrate the significance of groundwater inputs. For example, in the total maximum daily load ("TMDL") for dissolved oxygen in the Spokane River, Ecology recognized the significance of groundwater loading contribution to the river and assigned load allocations to groundwater. Source analyses by the Task Force also show groundwater's significance. Without taking the appropriate steps to develop a TMDL if necessary, and then allocate loads to point and non-point sources and only then impose WQBELs, Ecology is ignoring significant sources and forcing three Washington point sources to bear the entire burden of reducing PCB loads to the Spokane River.

The Spokane River does not exceed the applicable water quality standards for PCBs.

There is no basis for Ecology's contention that the Spokane River exceeds the applicable water quality standards for PCBs, as stated in the Fact Sheet accompanying Draft Permit No. WA0000892. Although it relies on the alleged exceedance as justification for WQBELs for PCBs, Ecology has not stated what data it relied upon to make its claim that the Spokane River exceeds PCB standards.

Moreover, Ecology's claim is inconsistent with a statement in the Fact Sheet accompanying another draft NPDES permit. In the Fact Sheet for the Liberty Lake Sewer and Water District's draft permit (Draft Permit No. WA0045144), Ecology states that "[t]he [reasonable potential analysis] did not show an exceedance of the water quality standard at the edge of the chronic mixing zone." Ecology has not explained this inconsistency or provided any basis for its claim that the Spokane River exceeds PCB water quality standards.

Ecology's assumption that the Spokane River exceeds applicable water quality standards for PCBs is inappropriate. Ecology should remove the inaccurate statement from the Kaiser Fact Sheet and remove the WQBELs it claims are warranted by the alleged exceedance.

Ecology did not consider all available data when it assumed the Spokane River exceeds applicable water quality standards for PCBs.

Because Ecology has not stated what data it relied upon to claim that the Spokane River exceeds PCB water quality standards, Kaiser and the public are forced to guess at the basis for Ecology's claim. It appears Ecology relied on just two data sets from sampling events in August 2014 and August 2015, during the low flow season. The Task Force initiated a sampling program in 2016 to collect data that would reflect river conditions in all seasons. This sampling program collected data in March, April, May, and June of 2016, and two additional sampling events will occur in Fall 2016. Ecology is aware of the 2016 sampling events because, like the August 2014 and August 2015 events, the samples were collected and analyzed under an Ecology-approved sampling quality assurance project plan ("QAPP"). Ecology prematurely issued draft permits that do not take into account all available data or data that will be available in Fall 2016.

Ecology should properly compile and consider all available data using the appropriate and consistent level of blank censoring.

In addition to ignoring available data, Ecology's application of blank censoring for relevant data is inconsistent. In March 2016, Ecology released a screening survey of PCBs in water, sediment, and fish tissue in the Little Spokane River (Ecology 2016, Publication No. 16-03-001). To evaluate PCB levels relative to water quality standards and sediment cleanup standards, Ecology's Environmental Assessment Program ("EAP") sampled media in the Little Spokane River and prepared the survey to report the results. EAP analyzed fish, sediment, and water samples using EPA Method 1668C and followed EPA's National Functional Guidelines for Organic Data Review (EPA 1999) using 10 times the laboratory amount in the blank as a threshold for positively identifying common laboratory contaminants. As indicated in the Fact Sheet accompanying Draft Permit No. WA0045144, Ecology used the same 10 times censoring factor to evaluate data when preparing Liberty Lake's draft permit.

Without explanation for the inconsistency, Ecology used a 3 times censoring factor to evaluate data when preparing Kaiser's draft permit. Ecology should state what data it relied upon and provide a complete data set which contains all available water quality measurements consistently and appropriately analyzed using the 10 times the blank censoring factor. Use of the 10 times the blank correction protocol, consistent with EAP's assessment of other Spokane River data sets and Ecology's evaluation of other draft permits, demonstrates that the Spokane River does not exceed applicable water quality standards for PCBs and that Kaiser's discharge has no reasonable potential to cause an exceedance of water quality standards.

Available data show that the Spokane River does not exceed applicable PCB water quality standards.

As explained, there is a robust PCB sampling data set from the Spokane River. Between May 2014 and June 2016, the Task Force has taken samples from eight river locations between the outlet of Lake Coeur d'Alene and Nine Mile Dam under varying flow conditions. This data was collected by the Task Force pursuant to an Ecology-approved QAPP and analyzed under EPA Method 1668C. Although Method 1668C is not approved under 40 C.F.R. Part 136, Ecology states in the Fact Sheet accompanying Draft Permit No. WA0000892 that it will apply targeted use of Method 1668C to analyze the reasonable potential of a discharge to affect water quality.

Kaiser contracted Hart Crowser to independently blank correct and blank censor all of the available PCB data collected by the Task Force under the Ecology-approved QAPP. Hart Crowser's Spokane River PCB congener data evaluation, the compilation and blank correcting/blank censoring of all Task Force collected data, is provided in Appendix B. The tables below summarize the individual location data. In addition, the arithmetic mean and geometric mean of all the data collected at each river sampling location have been calculated and are provided. The significance of the calculation of the arithmetic and geometric means, which shows that the Spokane River does not exceed applicable water quality standards for PCBs, will be further discussed below.

As shown in the tables below, both the arithmetic mean and the geometric mean PCB concentrations after appropriate blank censoring at each of the eight sample locations between 2014 and 2016 was less than the water quality standard for PCBs in Washington, 170 pg/L. Ecology should remove the WQBELs from Draft Permit No. WA0000892 because data show that the Spokane River meets the applicable water quality standard for PCBs and Kaiser has no reasonable potential to cause an exceedance of those standards.

Ecology should consider all available data and evaluate the longer term arithmetic and geometric means of PCBs to determine if the Spokane River meets applicable water quality standards.

There is no basis for Ecology's reliance on limited data sets that essentially reflect maximum observed conditions which is when the Spokane River is typically at its lowest flow rate. The appropriate assessment of exposure to PCBs, a US EPA classified B2 carcinogen, is the lifetime exposure level, which may best be represented by arithmetic or a geometric mean of the data, and not a maximum concentration under worst case conditions. (See page 3 of letter from Michael Lidgard (EPA) to Shara-Li Joy (Ecology) dated August 29, 2016 and Section 5.4.4 of EPA's March 1991 Technical Support Document for Water Quality Based Toxics Control). Water quality standards for carcinogens are based on a 70-year lifetime exposure level. While there is no 70-year data set available to assess water quality in the Spokane River, existing and soon to be available data establish concentrations over the course of a year. Instead of considering data reflecting spring runoff conditions (such as May 2014 and March through June 2016) and fall conditions (such as the upcoming Fall 2016 sampling event), Ecology appears to have considered only data from low flow summer conditions

sampled in August 2014 and 2015. Ecology should consider the full and robust data set to determine arithmetic and geometric mean concentrations across all flow conditions. The full data set will provide a better estimate of lifetime exposure than maximum observed conditions.

Lake Coeur d'Alene (SR-15)		
Sample Month	Samples	Concentration
May 2014	6	27 pg/L
August 2014	7	6 pg/L
August 2015		
March 2016	1	29 pg/L
April 2016	1	15 pg/L
May 2016	1	72 pg/L
June 2016	1	3 pg/L
Arithmetic Mean – 18 pg/L		
Geometric Mean - 11 pg/L		

Trent Bridge (Plante's Ferry) (SR-7)		
Sample Month	Samples	Concentration
May 2014		
August 2014	7	96 pg/L
August 2015	5	10 pg/L
March 2016	1	63 pg/L
April 2016	1	5 pg/L
May 2016	1	131 pg/L
June 2016	1	12 pg/L
Arithmetic Mean – 61 pg/L		
Geometric Mean – 22 pg/L		

Post Falls (SR-12)		
Sample Month	Samples	Concentration
May 2014		
August 2014	7	10 pg/L
August 2015		
March 2016		
April 2016		
May 2016		
June 2016		
Arithmetic Mean – 10 pg/L		
Geometric Mean - 9 pg/L		

Greene Street Bridge (SR-4)		
Sample Month	Samples	Concentration
May 2014		
August 2014	7	45 pg/L
August 2015	5	11 pg/L
March 2016	1	80 pg/L
April 2016	1	46 pg/L
May 2016	1	115 pg/L
June 2016	1	17 pg/L
Arithmetic Mean – 41 pg/L		
Geometric Mean – 22 pg/L		

Greenacres (SR-9)		
Sample Month	Samples	Concentration
May 2014		
August 2014	7	10 pg/L
August 2015	5	8 pg/L
March 2016		
April 2016		
May 2016		
June 2016		
Arithmetic Mean – 9 pg/L		
Geometric Mean – 7 pg/L		

Spokane Gage (SR-3)		
Sample Month	Samples	Concentration
May 2014		
August 2014	7	86 pg/L
August 2015	5	12 pg/L
March 2016	1	68 pg/L
April 2016	1	23 pg/L
May 2016	1	110 pg/L
June 2016	1	19 pg/L
Arithmetic Mean – 58 pg/L		
Geometric Mean – 28 pg/L		

Mirabeau (SR-8a)		
Sample Month	Samples	Concentration
May 2014	10	30 pg/L
August 2014		
August 2015	5	4 pg/L
March 2016		
April 2016		
May 2016		
June 2016		
Arithmetic Mean – 16 pg/L		
Geometric Mean - 13 pg/L		

Nine Mile Dam (SR-1)		
Sample Month	Samples	Concentration
May 2014		
August 2014	7	43 pg/L
August 2015		
March 2016	1	97 pg/L
April 2016	1	28 pg/L
May 2016	1	176 pg/L
June 2016	1	18 pg/L
Arithmetic Mean – 60 pg/L		
Geometric Mean – 39 pg/L		

Existence of a fish advisory does not justify imposing WQBELs where water quality standards are not exceeded.

Ecology's use of fish tissue data to justify WQBELs is inappropriate and arbitrary. Fish are exposed to PCBs through many pathways, including the water column, sediments, food sources, and the exposure pathways of their food sources. Moreover, fish tissue data is retrospective—it includes exposures from all sources over the course of the fish's life, a time period that can span more than twenty years. It is therefore inappropriate to use the existence of a fish advisory as a means of evaluating current conditions in the water column.

Additionally, it is inappropriate to impose WQBELs in Kaiser's draft permit and the other draft permits based on fish tissue data. Ecology has not demonstrated a link between PCBs in point source discharges, including the congener-level data available under Method 1668C, and any relevant fish data. Ecology's proposed conditions would force Washington point sources to assume the full burden of reducing potential sources of PCBs to fish while other sources remain uncontrolled. This is another example of Ecology's failure to conduct an appropriate and accurate reasonable potential analysis before proposing WQBELs for PCBs.

It is inappropriate for Ecology to mix and match analytical methods to set limits and then determine compliance.

Ecology proposes to use discharge data collected under Method 1668C, a congener-based analysis of total PCBs, to set WQBELs and then to use Method 608, an aroclor-based analysis, to determine compliance. There is a poor correlation between data collected under the two methods, and it is inappropriate for Ecology to mix and match.

Since 2003, Kaiser has collected final discharge data for total PCBs using Method 1668. The lab has also provided aroclor data. Based on 349 samples collected since 2003, the ratio of aroclor PCB totals to congener PCB totals has averaged 0.83 with a median value of 0.79 and a range between 2.34 and 0.35. While the maximum may be an outlier, there is a poor correlation between total PCB data evaluated under congener-based and aroclor-based data methods. It is arbitrary for Ecology to use a congener-based method to set effluent limits and an aroclor-based method to determine compliance.

Instead of proposing inappropriate WQBELs, Ecology should adopt the process developed by the DRBC.

The DRBC has developed a federally and state approved narrative process to address PCBs in the Delaware River. The approach is supported by two EPA regions, four states, and EPA Headquarters and the narrative limits have been incorporated in approximately 100 NPDES permits. Ecology should adopt this approach for Washington point sources to the Spokane River.

There are essentially four steps to the process:

- An "action level" is established for each point source based on discharge data analyzed under Method 1668C. This action level is the basis for evaluating

any PCB reduction activities. If the source ever exceeds the action level, the source must take any actions necessary to return levels below the action level.

- In addition to ongoing monitoring with Method 1668C, each source must develop a “discharge reduction plan” for the oversight agency’s review and approval. This plan identifies proposed actions to be taken to reduce PCB discharge levels at the point source.
- Performance is tracked throughout the permit cycle to evaluate the effectiveness of actions described in the discharge reduction plan. At the next permit renewal, the action level for the source is updated to reflect achieved reductions, and the plan is updated to include additional reduction actions.
- The progress made by implementation of the various discharge reduction plans is tracked as well as the overall impact of water quality through a river monitoring program.

See generally, DRBC, “Implementation Strategy for PCBs for Zone 2-6 of the Delaware River Estuary,” at “Appendix A, Delaware Estuary PCB Implementation Strategy: Approach for NPDES Permitting” (March 20, 2013), *available at* <http://www.state.nj.us/drbc/library/documents/implementation-strategyPCB0713.pdf>.

A similar approach should be implemented for the Spokane River, a waterbody with sources in two different states regulated by two different permitting agencies. The Task Force, a body of stakeholders that has already conducted sampling events and contracted for testing and analysis, is well equipped to track progress under permittees’ discharge reduction plans and to implement a river monitoring program to evaluate the impact on water quality.

There is no basis for Ecology to prohibit the discharge of groundwater from remediation activities.

To perform site cleanup actions pursuant to the Model Toxics Control Act (“MTCA”), Kaiser has coordinated with the Toxics Cleanup Program and, with Ecology’s approval, discharged deep aquifer groundwater to contain non-PCB contaminants of concern. Without providing any support for the condition, Draft Permit No. WA0000892 would require Kaiser to cease any remediation activities that would result in the discharge of groundwater. Kaiser is unaware of any discussion of this proposed condition between the Water Quality Program and the Toxics Cleanup Program staff overseeing cleanup activities at the facility. Any unilateral determination by the Water Quality Program of the efficacy of cleanup activities is inappropriate and conflicts with the directives of the Toxics Cleanup Program.

Moreover, Ecology’s assessment of the impact of site cleanup activities is flawed. Ecology’s claim that the cessation of groundwater discharge from on-site remediation activity through Outfall 007 will result in an estimated reduction of 50 mg/day PCBs from

Outfall 001 is flawed. As a part of the monitoring requirements under the current permit, flow from Outfall 007 (discharge of excess groundwater from remedial efforts from well WW-EW-02) has been monitored and reported. The daily average flow from July 2011 through September 2013 was 6.19 million gallons per day. In addition, as a part of the site remedial investigation and feasibility studies conducted at the site, PCB samples have been collected under the site's Sampling and Analysis Plan from well WW-EW-02 and the results have been reported to Ecology's Toxics Cleanup Program. The average of five samples collected from 2001 to 2015 was 20.2 pg/L. Based on this information, the estimated PCB levels from the Outfall 007 discharge would average approximately 0.47 mg/d, not the 50 mg/d reduction Ecology claims. The proposed permit condition associated with the cessation of discharge from Outfall 007 should be deleted.

Rather than unilaterally and unreasonably require remediation activities resulting in groundwater discharge to cease, Ecology should facilitate a cooperative approach between Kaiser's cleanup actions and any permit conditions intended to control PCB sources. BMPs in the NPDES permit could require annual discussions and evaluations of ongoing site activities by representatives from the Water Quality Program, the Toxics Cleanup Program, and Kaiser.

Ecology's approach to setting performance-based PCB limits is inconsistent with similar conditions addressing nutrients.

Ecology's approach to PCBs is inconsistent with its approach to nutrients. For nutrients, Ecology set the daily maximum and the monthly average limitations with a 10% "compliance buffer" added to the actual daily maximum and monthly average over the selected period. In contrast, Ecology set the PCB daily maximum and monthly average to equal the actual daily maximum and monthly average over the selected period. There is no basis for the inconsistency.

By failing to take the same approach for PCBs as it did for nutrients, Ecology ignores the inherent variability of daily maximums and monthly averages, especially where only two or three samples are collected each month. Ecology should set the PCB daily maximum limit at 160 mg/day and the monthly average limit at 142 mg/day to include a 10% compliance buffer. Alternatively, these limits could be the "action levels" in an approach consistent with the BMP-based process implemented by the DRBC.

Ecology prematurely and unreasonably requires compliance measurements under modified Method 608.

Although Ecology has specified that a modified Method 608 will be used to determine compliance, there is no guarantee that commercial laboratories will pursue certification for this modification or that Ecology will grant certification. It is Kaiser's understanding that Ecology has not granted any such certifications to date. The permit should state that Method 608 should be used to measure compliance until such time that laboratories are certified to perform the modified Method 608.

Ecology should modify the sampling frequency for PCB relative to EPA Method 608.

In Kaiser's draft permit, Ecology proposes twice per year (once every six months) sampling for PCBs analyzed under modified Method 608 to determine compliance with the proposed daily maximum and monthly average limits. Sampling only once every six months poses a significant risk of non-compliance with the monthly average limitation since there is only one sampling result during the month. Ecology needs to revise the monitoring frequency such that compliance with the monthly average is not jeopardized by requiring a single sampling event during a month. The monitoring requirement should be revised to require one sampling event per year that consists of two samples being collected during a single month.

Ecology has incorrectly transcribed the PCB average concentration.

In Appendix D of the Fact Sheet, Ecology reports the average PCB concentration for Outfall 001 for the period to be 2,426 pg/L, but in Table 4 of the Fact Sheet it reports the average concentration to be 2,261 pg/L. The 2,426 pg/L concentration is the correct value based upon the data reported. In addition to correcting this transcription error, the data in both locations should be identified as not having been blank censored.

Ecology's BMP requirement for elimination of PCB is an impossible standard to comply with due to the ubiquitous nature of PCB in materials at very low levels.

In proposed permit condition S6.B(e)(2), Ecology requires that, "After completion of the survey, the Permittee must prepare a schedule for eliminating any contribution of PCBs from these site materials and equipment to the final discharge." This requirement is not stated as a goal as in proposed condition S6.B(d), but assumes that either materials or equipment that could be used to replace identified items have substitutes that are completely non-PCB containing. Given that federal regulations allow PCB at levels well above zero, elimination is an impossible standard to comply with since there may be no substitutes that could meet this standard. The proposed permit condition should instead require minimization of PCB where suitable performing substitutes are available.

II. Nutrient Related Comments

Since Kaiser has already achieved the final WQBELs for total phosphorus, carbonaceous biological demand, and ammonia, it is inappropriate for Ecology to continue to include the implementation and reporting of BMPs and to set interim limitations for these pollutants.

As has been demonstrated by Kaiser's effluent data submitted during this permit cycle, the discharge levels for total phosphorous, carbonaceous oxygen demand and ammonia already comply with the final WQBELs for these parameters. Because Kaiser has achieved compliance with the WQBELs ahead of schedule, the requirements to continue implementing and reporting BMPs and to provide an annual status report should be removed from the permit. In addition, interim limitations for nutrients should be removed from the permit and the final WQBELs should become effective with this permit cycle because Kaiser has already demonstrated compliance with the final limits.

Ecology's statement that it must apply the most stringent of either WQBELs or technology-based effluent limits potentially undermines not only Delta Elimination Plans developed by dischargers but also is contrary to the State's pollutant trading policy.

In the Fact Sheet accompanying Draft Permit No. WA0000892, on Page 16, Ecology discusses technology-based and water quality-based permit limits. Ecology states that "Ecology must apply the most stringent of these limits to each parameter of concern." With respect to technology-based limits, Ecology consistently sets performance-based limits if the source demonstrates that it outperforms the technology-based limitation. It is not clear whether Ecology will follow the same practice if a source outperforms a WQBEL. In that scenario, will Ecology set a more stringent performance-based limitation? Under the dissolved oxygen TMDL, the permittees prepared Delta Elimination Plans for complying with the WQBELs and included such elements as pollutant trading and "bubble permits." In either case, a permittee must perform at a level below its WQBEL in order to generate a "credit." If Ecology were to follow the same practice of setting performance-based limitations whenever a source outperforms its WQBEL requirements, then any trading or bubble permit would not be possible because the agency would eliminate any "credits" for outperforming. Ecology should clearly state that it will not set a performance-based limit for a parameter that outperforms the WQBEL. Otherwise, Washington's entire pollutant trading policy is undermined.

III. Temperature Related Comments

Ecology has incorrectly chosen the plant's intake water sampling location as representative of river temperature at the point of discharge.

Ecology correctly notes that temperature data from upstream locations such as Stateline and Barker Road would not represent conditions at Kaiser's point of discharge due to the significant amount of groundwater that enters the river's gaining reach in the vicinity of the facility.

In the draft permit, Ecology proposes that ambient river temperature be monitored in the discharge of the river water supply pumps in Kaiser's pump house. Measurements of the ambient river temperature at this location suffer from the same non-representativeness issue as the upstream locations discussed above. The monitoring point for temperature is downstream of the water supply pumps—there are several hundred yards between the intake structure and Kaiser's discharge location downstream. This portion of the river continues to be a gaining reach, and the significant groundwater input must be considered in the selection of the monitoring location.

In order to correctly determine the ambient river temperature at the point of Kaiser's discharge, the monitoring location must be set at a point in the river just upstream of the facility's discharge diffuser. Since an in-river monitoring system is best installed, from a diver safety standpoint, during river low flow conditions, the permit should be modified

such that the monitoring requirement becomes effective no later than September 30, 2017.

IV. Critical Flow and Related Conditions

Ecology's application of the timeframe that best reflects current conditions is inconsistent.

In the Fact Sheet, Ecology determined that the most representative timeframe for both PCB discharge and for nutrient discharge is from September 2013 onward, based on reconfiguration of the water intake supply sources (river and groundwater) that led to a reduction in water discharge volume. Unfortunately, Ecology failed to carry this finding forward with respect to the actual discharge flow from the facility for making calculations related to critical flow determinations.

Based upon Ecology's determination that the most representative period for discharge parameters is after September 2013, the following critical flow conditions for the facility are appropriate and the basis for the permit related calculations should be revised as follows:

- Maximum average monthly effluent flow – 9.7 MGD
- Annual average flow – 8.6 MGD (highest 12 month running average)
- Maximum daily flow – 15.1 MGD

Based upon the use of the appropriate flow data from above, dilution factors and the ACEC and CCEC should be updated as follows:

- Aquatic Life DF – 1.5 (acute)
- Aquatic Life DF – 9.1 (chronic)
- Human Health, Carcinogen – 51.2 (chronic)
- Human Health, Non-carcinogen – 11.8 (chronic)
- ACEC – 66.7%
- CCEC – 11.0%

V. Intake Structure Related Conditions

The proposed permit requires the performance of certain studies related to the facility's river water intake structure. The proposed permit requires that these studies be submitted within three years of the permit's effective date. The requirement in 40 CFR 125.91 to perform the specified studies applies to facilities that have a design intake flow greater than two million gallons per day and more than 25% of the actual flow is used for cooling purposes. During the upcoming three year period, Kaiser will be evaluating the potential of reducing water usage such that river water intake for cooling purposes will be unnecessary. Accordingly, Kaiser requests that the permit language clearly state that Kaiser is not required to submit the required studies within three years

if within the three year period it no longer meets the applicability criteria for conducting these studies.

VI. Additional Fact Sheet Comments

After review of the draft Permit Fact Sheet, the following additional issues were identified:

- Page 1 of the Fact Sheet should be revised to show that the facility also discharges stormwater in addition to those sources already noted.
- Page 8 of the Fact Sheet should be revised to show that there are approximately 900 employees at the facility.
- Page 9 of the Fact Sheet references the final filtration system as being a "black" walnut shell system. Due to the limited availability of black walnut shells the filter media is a mixture of black and English walnut shells. The reference to media should be limited to walnut shell without reference to the specific type of shells throughout the document.
- Page 10 of the Fact Sheet contains references to internal Outfall 004 and internal Outfall 005. These references are reversed. Internal Outfall 004 is the south outfall, and internal Outfall 005 is the north outfall.
- On Page 11 of the draft permit, it should be footnoted that the flow at final Outfall 001 is determined by summing the flow of internal Outfall 006 and the flow of internal Outfall 007. It should also be footnoted that in the event of a meter failure at internal Outfall 006, the flow will be determined by summing up the flow from internal Outfall 002, internal Outfall 003, internal Outfall 004 and internal Outfall 005.

VII. General Comments

Proposed permit condition S2.C(3)(b) related to continuous pH monitoring system calibration is inappropriate. The proposed requirement should state that the actual field pH probe should be calibrated in the field with standard buffers.

At the Kaiser facility, analysis of compliance samples is carried out using both the internal certified laboratory for certain parameters and outside contract laboratories for other analyses. It is expected that the analysis of compliance samples for lead and cadmium will continue to be performed by an outside contract laboratory as well as PCB analyses by EPA Methods 8082ULL and EPA Method 1668C. In addition, any EPA Method 608 Modified analyses would be performed by an outside contract laboratory.

The draft permit would require that all permit required reporting be submitted and received at Ecology by the fifteenth of the following month. Based on the last five years of experience, all analytical results from outside contract laboratories are rarely, if ever, received in time to meet the current reporting date of the twenty-fifth of the following month. Shortening the submittal time period from the twenty-fifth of the following month

to the fifteenth of the following month guarantees that all analytical results will not be received for a timely submittal as proposed in the draft permit especially for the long turnaround times for analyses such as PCB. Kaiser is concerned that the inability to receive all analytical results and to report them by the fifteenth of the following month will be deemed non-compliance with the permit.

The permit needs to clearly state that all data not available at the time that the Discharge Monitoring Report (DMR) is due must be reported within fifteen days of receipt. In addition, the permit needs to state that if the data is provided within fifteen days of receipt if not available when the DMR is submitted, it will not be considered as a failure to report and therefore will not be viewed as non-compliance with the permit.

VIII. Conclusion

Kaiser respectfully requests that Ecology correct the problems identified in these comments before issuing the final permit.

Ecology should implement EPA's recommendation, and the federally and state approved approach of the DRBC, to require the implementation of BMPs to achieve further reductions of PCBs to the Spokane River, and not include PCB WQBELs in this permit cycle.

Please feel free to contact me with any questions regarding these comments at (509) 927-6554.

Sincerely,



Bernard P "Bud" Leber, Jr.
Environmental Manager

Appendix A



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
WATER AND
WATERSHEDS

JUL 13 2015

Reply to
Attn of: OWW-191

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Jim Bellatty
Washington State Department of Ecology
4601 North Monroe Street
Spokane, WA 99205-1295

Re: NPDES Permitting Recommendations for the Spokane River Watershed

Dear Mr. Bellatty:

In response to the U.S. District Court order in *Sierra Club et al. v. McLerran*, No. 11-CV-1759-BJR, the EPA is making the enclosed permitting recommendations to the Washington State Department of Ecology (Ecology). These recommendations are specific to National Pollutant Discharge Elimination System (NPDES) permits for point sources discharging to the Spokane River in Washington (water resource inventory areas—WRIAs—54 and 57), the Little Spokane River (WRIA 55). Except for recommendations specific to certain dischargers in the State of Washington, these recommendations are also applicable to EPA Region 10's direct implementation NPDES permitting for discharges to the Spokane River in Idaho (hydrologic unit code 17010305) and on the Spokane Indian Reservation.

Although the EPA encourages Ecology to consider and as appropriate accept the enclosed recommendations, they are not binding. The goal of these recommendations is to help Ecology establish enforceable and defensible permit conditions that can reasonably be expected to result in reductions in polychlorinated biphenyl (PCB) loading to the Spokane River and the Little Spokane River from regulated point sources. The EPA encourages Ecology to establish permit conditions to further that goal, even if they are different from the enclosed recommendations.

If you have any questions about the enclosed recommendations, please contact Brian Nickel of my staff at 206-553-6251 or Nickel.Brian@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael J. Lidgard".

Michael J. Lidgard
Manager, NPDES Permits Unit

cc: Mr. Daniel Redline, Regional Administrator, Idaho Department of Environmental Quality Coeur d'Alene Regional Office

July 13, 2015

Permitting Recommendations for the Spokane River Watershed

Introduction

In response to the U.S. District Court order in *Sierra Club et al. v. McLerran*, No. 11-CV-1759-BJR, the EPA is making the following permitting recommendations. These recommendations are specific to National Pollutant Discharge Elimination System (NPDES) permits for point sources discharging to the Spokane River in Idaho (hydrologic unit code 17010305) and Washington (water resource inventory areas—WRIAs—54 and 57, including waters of the Spokane Tribe of Indians) and the Little Spokane River in Washington (WRIA 55).

Although the EPA encourages Ecology and the permitting authority for Idaho and the Spokane Tribe of Indians (currently EPA Region 10) to consider and as appropriate accept these recommendations, these recommendations are not binding. The goal of these recommendations is to help the permitting authorities establish enforceable and defensible permit conditions that can reasonably be expected to result in reductions in polychlorinated biphenyl (PCB) loading to the Spokane River and the Little Spokane River from regulated point sources. The EPA encourages permitting authorities to establish permit conditions to further that goal, even if they are different from the conditions recommended herein. This document is not legally enforceable; it does not confer rights or impose obligations on any party, including EPA, States or the regulated community.

Rationale for Recommending a BMP Approach to PCB Control

In general, the EPA is currently recommending a best management practices (BMP) approach to controlling and abating discharges of PCBs from point sources in the Spokane watershed. As explained below, the EPA believes this approach will be more effective in reducing discharges of PCBs than numeric effluent limits. The authority to establish BMP conditions in NPDES permits is provided in 40 CFR 122.44(k).

Limitations of Approved Analytical Methods for PCBs

Federal regulations require NPDES permits to include requirements to monitor discharges according to procedures approved under 40 CFR Part 136, unless another method is required by 40 CFR subchapters N or O (i.e. pretreatment requirements, effluent limit guidelines, or sewage sludge requirements).¹ For pollutants without approved analytical methods, the permitting authority shall specify in the permits the test procedure(s) to be used.²

The PCB water quality criteria for the States of Idaho and Washington and the Spokane Tribe of Indians are expressed as total PCBs, which is the sum of all congener, isomer, homolog, or aroclor analyses.³

¹ 40 CFR 122.41(j)(4), 122.44(l)(1)(iv)

² 40 CFR 122.44(l)(1)(iv)

³ See footnote q to 40 CFR 131.36(b)(1) and footnote o to IDAPA 58.01.02.210.01. See also: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#htable>

July 13, 2015

Thus, any water quality-based effluent limit (WQBEL) for PCBs must also be expressed as total PCBs.⁴ The approved analytical methods for PCBs can only measure PCB aroclors (i.e., the mixtures of PCBs that were sold commercially⁵). Because total PCBs may be measured as the sum of aroclor analyses, the approved methods can be used for total PCBs and therefore must be used to determine compliance with WQBELs for total PCBs.⁶

Of the methods approved for national use under 40 CFR 136, the most sensitive (EPA Method 608) can quantify PCB aroclors at concentrations of about 0.5 µg/L (500,000 pg/L) or greater, which is about 3,000 times Washington's PCB criterion (170 pg/L) and about 385,000 times the Spokane Tribe's PCB criterion (1.3 pg/L). Thus, any numeric WQBEL for PCBs for a point source to the Spokane River is likely to be orders of magnitude lower than the concentrations quantifiable by approved analytical methods.

If a WQBEL is below the detection limit, EPA guidance recommends that the permit include the actual limit and a requirement for the specific method to be used for monitoring. The permit should also state that any sample analyzed using the specified method and found to be below the minimum level will be deemed compliant with the limit.^{7,8} Thus, WQBELs for total PCBs, which would need to be enforced using the approved methods, would, in effect, allow discharges of total PCBs many thousands of times greater than criteria. Because actual discharges from Spokane River point sources have been orders of magnitude below the quantification limits of the approved methods, such methods would provide no quantitative data on the actual loading of PCBs from point sources, no incentive for point sources to reduce discharges, nor any means to determine whether the discharges are increasing or decreasing.

Basis for Requirements to Analyze PCB Congeners in Support of BMPs

When establishing monitoring requirements for PCBs in order to assess the effectiveness of BMPs, EPA recommends that the permit authority require analysis of PCB congeners, because this aids in source identification, which will, in turn, aid in source control.⁹ There are no approved methods for PCB congeners (as distinct from aroclors). As explained above, for pollutants without approved methods, such as PCB congeners, the permitting authority shall specify the test procedure(s) to be used; thus, permitting authorities have the flexibility to require the use of EPA Method 1668C for monitoring of PCB congeners.

Monitoring requirements for PCB congeners using Method 1668C can provide quantitative data about the actual PCB loading from point sources. This represents a significant advantage over numeric WQBELs for total PCBs, which, as explained above, currently must be enforced using the far less sensitive approved analytical methods. Therefore, the EPA is recommending that the permits continue to use a BMP approach to PCB control and require the use of EPA method 1668C for monitoring of final effluents for PCB congeners, instead of establishing numeric WQBELs enforced using methods approved under 40 CFR Part 136.

⁴ 40 CFR 122.44(d)(1)(iii)

⁵ <http://www.epa.gov/epawaste/hazard/tsd/pcbs/pubs/aroclor.htm>

⁶ 40 CFR 122.44(i)(1)(iv)

⁷ *Technical Support Document for Water Quality-based Toxics Control* (EPA/505/2-90-001, March 1991) Section 5.7.3.

⁸ 40 CFR 136 Appendix A

⁹ <http://srrtlf.org/wp-content/uploads/2014/10/2015-Spokane-PCBs-1.pdf>

July 13, 2015

Even if the permitting authority determines that it is appropriate to include numeric WQBELs for PCBs to be enforced using methods approved under 40 CFR 136 in one or more of the subject permits, the EPA nonetheless recommends that the permitting authority include the following BMP requirements and monitoring for PCB congeners using EPA method 1668C in addition to any such numeric WQBELs.

1 General Recommendations for All POTWs Discharging to the Spokane River in Idaho and Washington, Kaiser Aluminum (permit #WA0000892), and Inland Empire Paper (permit #WA0000825)

The EPA recommends that:

- The permits should require monitoring of final effluents for PCB congeners using EPA Method 1668C at least quarterly.
- When establishing requirements for toxics management plans (TMP) or best management practices (BMP) plans, the permitting authority should consider the assessment by the Spokane River Regional Toxics Task Force (“Task Force”) of the optimal mix of BMPs applicable to the permitted source.¹⁰
- The permits should require an annual report of PCB monitoring results and activities that have been completed or that have been ongoing in the past twelve months, pursuant to the TMP or BMP plan. The annual report should include:
 - A summary of effluent PCB data and any other PCB data relevant to the discharge (e.g., raw sewage, biosolids, pretreatment, or internal monitoring locations) collected over the previous twelve months.
 - A comparison of effluent PCB data collected over the previous twelve months to older effluent data.
 - An estimate of the reduction in PCB loading or concentration achieved through TMP or BMP plan activities during the previous twelve months.
 - Additional TMP or BMP plan activities planned for the following twelve months.
- The permits should require an update to the TMP or BMP plan if the permitting authority determines, based on the annual reports and other available information, that the TMP or BMP plan will not likely reduce PCB discharges to the maximum extent practicable.
- The permits should require reporting of total concentration of “dioxin-like” PCB congeners on DMRs.¹¹
- The permits should require the complete congener analyses to be submitted as attachments to the DMRs.
- The permits should require receiving water monitoring for PCB congeners upstream and downstream of the outfalls using EPA Method 1668C at a frequency adequate to assess both high and low river flow conditions.

¹⁰ The assessment of BMPs is Task 2 of Phase 4 of the Task Force’s Technical Consultant Work Plan and is scheduled to be completed by September 2016.

¹¹ The dioxin-like PCB congeners are IUPAC numbers 77, 81, 105, 114, 118, 123, 126, 156, 157, 167, 169, and 189.

July 13, 2015

1.1 Specific Recommendations for POTWs

1.1.1 All POTWs

The EPA recommends that:

- The permits should require operation of tertiary filtration (once completed) year-round.¹²
- Prior to completion and optimization of tertiary filtration, the permits should include BMP requirement(s) to minimize discharges of TSS.¹³
- The permits should prohibit the POTW from authorizing discharges of PCBs to the treatment works unless the PCB concentration is <3 µg/L or unless the discharge is in accordance with a PCB discharge limit included in a pretreatment permit issued under §307(b) of the Clean Water Act.¹⁴

1.1.2 Pretreatment POTWs Only

The EPA recommends that:

- The permits should require sampling of all significant industrial users' (SIU) discharges for PCB aroclors using the most sensitive method approved under 40 CFR Part 136. All PCB aroclor results above the method detection limit (MDL) should be reported to the POTW and to the approval authority.
 - For any SIU where PCB aroclors are detected using approved methods, follow-up monitoring for PCB congeners using EPA Method 1668C should be performed at least once.
 - The POTW should use the results of the required monitoring of SIUs and any other available information to estimate the combined loading of total PCBs to the POTW from all SIUs.
 - If the POTW estimates that the combined loading of total PCBs to the POTW from all SIUs is at least ten percent of the influent total PCB loading to the POTW, the POTW should either develop numeric local limits for total PCBs or require SIUs to implement BMPs¹⁵ to reduce discharges of total PCBs to the POTW.

1.2 Specific Recommendations for Industrial Individual Permits (Kaiser Aluminum and Inland Empire Paper)

The EPA recommends that:

- Ecology should analyze available effluent TSS and PCB data to determine if effluent TSS and PCB concentrations are positively correlated.

¹² Phosphorus limits necessary to meet dissolved oxygen criteria will require operation of tertiary filtration (i.e., advanced solids removal) to meet effluent limits for phosphorus for eight to nine months of the year. This will reduce total suspended solids (TSS) loading, and, in turn, PCBs. Operating this kind of treatment year-round (even when not necessary to meet phosphorus limits) will further reduce TSS and PCBs on an annual basis. BMPs can include "treatment requirements" (40 CFR 122.2).

¹³ PCB removal in POTWs is correlated with TSS removal. BMPs may be required when "the practices are reasonably necessary...to carry out the purposes and intent of the CWA" (40 CFR 122.44(k)(4)).

¹⁴ 40 CFR 761.50(a)(3)

¹⁵ Local limits may be BMPs instead of numeric limits (40 CFR 403.5(c)(4)).

July 13, 2015

- If effluent TSS and PCB concentrations are determined to be positively correlated, Ecology should establish all known, available and reasonable treatment (AKART) or performance-based effluent limits for TSS. AKART or performance-based TSS limits should be re-evaluated following completion and optimization of tertiary filtration.
- The permits should require the permittee to address water conservation in its BMP plan.

1.2.1 Specific Recommendations Kaiser Aluminum

- The permit should require separate monitoring of the groundwater remediation discharge (if any) and the effluent from the black walnut shell filters for PCB congeners using EPA Method 1668C.

2 Recommendations for Fish Hatcheries in WRIAs 54, 55, and 57

The EPA recommends that:

- The permits should require monitoring of effluents for PCB congeners using EPA Method 1668C at a frequency adequate to assess sources of PCBs within the facility.
- The permits should require reporting of the total concentration of "dioxin-like" PCB congeners on DMRs.
- The permits should require the complete congener analysis to be submitted as an attachment to the DMR.
- The permits should require that the facilities' pollution prevention plans or BMP plans address PCBs from caulk, paint, and feed.
 - The permits should require removal of paint or caulk that contacts process water and that was applied prior to January 1, 1980.
 - During removal, permittees should implement PCB abatement and disposal consistent with EPA guidance.¹⁶
 - Permits should require BMPs to prevent removed PCB-containing paint or caulk from reaching waters of the United States and to ensure that disposal of such materials is performed in compliance with applicable state, federal, and local laws.
 - The permits should require the permittee to use any available product testing data to preferentially purchase paint and caulk with the lowest practicable total PCB concentrations.
- Recommendations for general NPDES permits may be incorporated into the permits themselves or into administrative orders, as appropriate.

3 General Recommendations for Stormwater Permits

The EPA recommends that:

- The permits, except construction stormwater permits, should require monitoring for PCBs at frequencies and locations adequate to assess and identify sources of PCBs to stormwater.
 - In general, for water sampling, the permits should require monitoring for PCB congeners using EPA Method 1668C. For monitoring of locations or waste streams that the

¹⁶ <http://www.epa.gov/epawaste/hazard/tsd/pCBS/pubs/caulk/guide/guide-sect4.htm>

July 13, 2015

permitting authority determines can be adequately characterized using less sensitive methods (e.g., EPA Method 608 or 8082), such methods may be used at such locations.

- For any monitoring of PCB congeners in final effluent, the permits should require reporting of the total concentration of "dioxin-like" PCB congeners on DMRs.
- For any monitoring of PCB congeners in final effluent, the permits should require the complete congener analysis to be submitted as an attachment to the DMR.
- When updating stormwater pollution prevention plan or stormwater management plan (SWPPP or SWMP) requirements in permits, the permitting authority should consider the Task Force's assessment of the optimal mix of BMPs applicable to the permitted sources.
- Recommendations for general NPDES permits may be incorporated into the permits themselves or into administrative orders, as appropriate.

3.1 Specific Recommendations for Areas of Permitted MS4s Contributing to Surface Water Discharges to the Spokane River or the Little Spokane River'

The EPA recommends that:

- In addition to the general stormwater monitoring recommendations above, the permits should require monitoring for PCBs in sediment traps, catch basins, and in stormwater suspended particulate matter (SSPM) at frequencies and locations adequate to assess and identify sources of PCBs to municipal stormwater.
 - For monitoring of PCBs in solids, the permits should require a quantitation level for total PCBs no greater than 10 µg/kg dry weight.
- The permits should require all BMPs related to reducing or eliminating PCBs in stormwater to be prioritized in areas of the MS4 more likely to contribute PCBs to surface waters, based on any available information, including but not limited to the following:
 - Previous and ongoing PCB monitoring.
 - Nearby toxics cleanup sites with PCBs as a known contaminant.
 - Business inspections and compliance records.
- The permits should require removal of accumulated solids from drain lines (including inlets, catch basins, sumps, conveyance lines, and oil/water separators) in priority areas of the MS4 at least once during the permit cycle, unless the permittee can demonstrate that such removal is not necessary to reduce discharges of PCBs from stormwater.
- The permits should require removal of any identified legacy PCB sources within the MS4 (e.g., PCB-containing sealant) as soon as practicable.
- The permits should require preferential purchasing by the permittee of products with the lowest practicable PCB concentrations for products likely to contain inadvertently generated PCBs and to contact municipal stormwater, including but not limited to the following:
 - Hydroseed
 - Dust suppressants
 - Traffic marking paint
 - Deicer
- The permits should allow permittees to comply with PCB source control requirements through a collaborative effort.

July 13, 2015

- The permits should include the following requirements for new development and redevelopment disturbing one acre or more:
 - Site design to minimize impervious areas, preserve vegetation, and preserve natural drainage systems.
 - On-site stormwater management.

3.1.1 Specific Recommendations for Cities and Counties with MS4 Permits

The EPA recommends that:

- The permits should require the following, for construction projects requiring a building permit from the permittee that do **not** require an NPDES permit for construction stormwater:
 - During demolition of any structure with at least 10,000 square feet of floor space and built before January 1, 1980, the permittee should require the building permit applicant to implement BMPs to achieve the following:
 - Prevent removed PCB-containing building materials, including paint, caulk, and pre-1980 fluorescent lighting fixtures,¹⁷ from contacting municipal stormwater or otherwise reaching waters of the United States; and
 - Ensure that disposal of such materials is performed in compliance with applicable state, federal, and local laws.
- The permits should address possible contributions of PCBs to the MS4 from businesses within the areas served by the MS4 as follows:
 - The permits should require the establishment and maintenance of a database of inspections and status of compliance with applicable State and federal laws and local ordinance related to PCBs in stormwater, for businesses within the area served by the MS4.
 - Based on the information in the database and other available information, the permits should require the permittees to identify businesses that are likely to contribute PCBs to the MS4 and to follow up with such businesses and appropriate regulatory agencies to develop and implement BMPs to reduce contributions of PCBs to the MS4 from such businesses.

3.1.2 Specific Recommendations for Idaho MS4 Permits

The EPA recommends that:

- The permitting authority should issue a Clean Water Act §308 letter requiring monitoring for PCBs at frequencies and locations adequate to assess and identify sources of PCBs to stormwater, unless final permits including such monitoring requirements are issued by July 1, 2016.
 - In general, the permits should require monitoring for PCB congeners using EPA Method 1668C. For monitoring of locations or waste streams that the permitting authority determines can be adequately characterized using less sensitive methods (e.g., EPA Method 608 or 8082), such methods may be used at such locations.

¹⁷ <http://www.epa.gov/solidwaste/hazard/tsd/pcbs/pubs/ballasts.htm>

July 13, 2015

3.2 Specific Recommendations for Industrial Stormwater Permits

The EPA recommends that:

- The permits should require removal of accumulated solids from storm drain lines (including inlets, catch basins, sumps, conveyance lines, and oil/water separators) within the facility at least once during the permit cycle, unless the permittee can demonstrate that such removal is not necessary to reduce discharges of PCBs from stormwater.
- The permits should require removal of any identified legacy PCB sources within the facility's storm drain lines (e.g. PCB-containing sealant) as soon as practicable.
- If hydroseed is used for erosion and sediment control, the permittee should use any available product testing data to preferentially purchase hydroseed with the lowest practicable total PCB concentration.¹⁸
- If dust suppressants other than water are used (e.g., on unimproved roads), the permittee should use any available product testing data to preferentially purchase dust suppressants with the lowest practicable total PCB concentration.¹⁹

3.3 Specific Recommendations for Construction Stormwater Permits

The EPA recommends that:

- During demolition of any structure with at least 10,000 square feet of floor space and built before January 1, 1980, the permits should require the permittee to implement BMPs to achieve the following:
 - Prevent PCB-containing building materials, including paint, caulk, and pre-1980 fluorescent lighting fixtures, from contacting stormwater or otherwise reaching waters of the United States; and
 - Ensure that disposal of such materials is performed in compliance with applicable state, federal and local laws.
- If dust suppressants other than water are used, the permittee should use any available product testing data to preferentially purchase dust suppressants with the lowest practicable total PCB concentration.
- If hydroseed is used, the permittee should use any available product testing data to preferentially purchase hydroseed with the lowest practicable total PCB concentration.

¹⁸ The Task Force is investigating PCBs in hydroseed. Product testing by the City of Spokane showed PCB concentrations of about 2.5 ppm in hydroseed.

¹⁹ The City of Spokane's product testing found concentrations ranging from 0.09 – 3.6 ppb (i.e., a two-order-of-magnitude range).

Appendix B

MEMORANDUM

DATE: September 8, 2016

TO: Bud Leber - Kaiser Aluminum

FROM: Roger McGinnis - Hart Crowser

RE: Spokane River PCB Congener Data Evaluation
2644-152

CC: Chris Poulsen - Hart Crowser



This memorandum documents the procedures used by Hart Crowser for blank correction/blank censoring and calculation of total polychlorinated biphenyl (PCB) concentrations in the analysis of all available PCB data collected by the Spokane River Regional Toxics Task Force (SRRTTF) between May 2014 and June 2016. Seven to 17 discrete samples were collected from each of eight stations for a total of 110 samples.

Treatment of Non-detected Results

Non-detected ("U" qualified) results for each congener in laboratory method blanks and samples were set equal to zero.

Blank Correction and Blank Censoring

Both blank corrected and blank censored results were evaluated using both 3 times and 10 times the blank concentration as described in the following sections.

Blank Corrected Results

After setting non-detected results equal to zero, blank corrected sample results for each congener were calculated by subtracting 3 times and 10 times the blank concentration from the sample concentration according to the following equation:

Blank corrected result = Sample Concentration – 3 x (and 10 x) Blank Concentration

If the calculated blank corrected result for a congener was less than zero, results were set equal to zero. Total PCBs were then calculated as the sum of the blank corrected congener results.



Blank Censored Results

After setting non-detected results equal to zero, blank censored sample results for each congener were evaluated by comparing 3 times and 10 times the blank concentration to the sample concentration according to the following procedure:

If: Sample Concentration – 3 x (and 10 x) Blank Concentration < 0

Then: Blank censored result = 0

Otherwise: Blank censored result = laboratory reported congener concentration

Total PCBs were then calculated as the sum of the blank censored congener results.

Treatment of Replicate Results

Several laboratory data packages had more than one method blank associated with samples. In these instances non-detected congener results for each blank were set equal to zero and the average concentration for each congener was used for blank correction/censoring.

Duplicate samples were collected from sampling stations SR-15 and SR-8a in 2014. For duplicates, blank correction was performed on each of the samples and the average total PCB concentration was reported.

Treatment of Tentatively Identified Congeners

Many individual congener results had a "N" qualifier which is defined as a tentative identification. These data were qualified "K" by the laboratory indicating that, while the analyte had the proper chromatographic retention time, the ion ratios for the congener did not meet the identification criteria and, therefore, the congener was not positively identified. Each of the tentatively identified values assumes the congener is present and the result is an estimated maximum possible concentration that potentially causes a high bias in the total PCB results.

During data validation "K" qualified data are typically treated as non-detected rather than tentatively identified. Therefore, calculated total PCB results from SRRTF sampling have a high bias and should be considered conservative values.

Results

Total PCB concentrations calculated from blank corrected and blank censored data using both 3 times and 10 times the blank concentration are provided in the attached tables for all sampling stations. Calculated total PCB concentrations have a high bias since tentatively identified congeners were treated as detected



Kaiser Aluminum - Trentwood
September 8, 2016

2644-152
Page 3

with an estimated maximum possible concentration rather than considered non-detected as typically done.

Attachments: Tables – Spokane River PCB Sampling Data

L:\Notebooks\2644152_Kaiser Groundwater Sampling 2016\Workspace\River PCB Data\Spokane River PCB Blank Correction Procedure Memo.docx

Spokane River PCB Sampling Data
 Sample Concentration - 3x Blank Concentration

Date	Lake Coeur d'Alene Outlet SR-15	Post Falls SR-12	Greenacres SR-9	Mirabeau SR-8a	Trent Bridge (Plante's Ferry) SR-7	Green Street Bridge SR-4	Spokane Gauge SR-3	Nine Mile Dam SR-1
05/13/14	33.624			12.506				
05/15/14	19.324			26.162				
05/17/14	37.689			39.212				
05/19/14				44.0315				
05/21/14				36.2525				
08/12/14	8.308	30.795	13.86		140.614		127.047	53.887
08/13/14								
08/14/14	22.257	10.37	9.241		70.97	131.906		
08/15/14						115.208		99.084
08/16/14	8.582	9.587	9.566		99.405	59.899	248.92	108.208
08/17/14								
08/18/14	2.939	10.832	32.697		329.734	71.534	141.781	115.559
08/19/14								
08/20/14	8.022	10.119	8.695		102.745	125.148	106.705	152.403
08/21/14								
08/22/14	1.673	6.134	1.089		31.669	23.27	237.285	36.8
08/23/14	0.911	5.259	7.104		45.952	16.621	29.367	35.409
08/24/14			1.02	1.393	10.735	56.285	2.889	
08/18/15			6.613	9.238	77.463	11.362	1.861	
08/19/15			17.464	5.011	44.499	33.433	71.857	
08/20/15			46.648	3.255	51.922	63.701	67.072	
08/21/15			6.536	2.282	79.671	34.228	63.349	
08/22/15	30.429				67.523	84.63	74.575	104.094
03/24/16	17.203				7.732	56.884	35.117	41.175
04/19/16	74.403				141.158	122.071	114.836	187.407
05/24/16	3.029				26.136	26.178	27.335	26.72
06/16/16								

Date	Lake Coeur d'Alene Outlet SR-15	Post Falls SR-12	Greenacres SR-9	Mirabeau SR-8a	Trent Bridge (Plante's Ferry) SR-7	Green Street Bridge SR-4	Spokane Gauge SR-3	Nine Mile Dam SR-1
05/13/14	12.294	33.624	7.652	12.506				
05/15/14	17.656	19.324	43.396	26.162				
05/17/14	36.659	37.689	45.471	39.212				
05/19/14			50.638	44.0315				
05/21/14			44.769	36.2525				

Mirabeau
SR-8a Average

Lake Coeur d'Alene Outlet
SR-15 Average

Spokane River PCB Sampling Data
 Sample Concentration - 10x Blank Concentration

Date	Lake Coeur d'Alene Outlet SR-15	Post Falls SR-12	Greenacres SR-9	Mirabeau SR-8a	Trent Bridge (Plante's Ferry) SR-7	Green Street Bridge SR-4	Spokane Gauge SR-3	Nine Mile Dam SR-1
05/13/14	32.719	19.055	11.126	10.078	91.243	61.265	52.792	53.887
05/15/14	18.724	10.37	9.241	22.75	16.323	51.397	28.834	33.708
05/17/14	31.943	9.488	9.566	37.506	23.528	23.743	110.75	35.33
05/19/14		10.832	25.376	39.654	189.913	22.908	48.621	37.71
05/21/14	7.377	9.747	8.695	35.1835	31.211	34.16	23.368	37.019
08/12/14	13.303	5.868	1.089		7.054	8.567	52.668	11.801
08/13/14	8.303	5.259	7.104		9.796	7.896	12.68	10.91
08/16/14	2.939		1.02	1.393	0.842	3.045	2.889	
08/17/14	8.022		6.613	8.738	20.745	1.562	1.861	
08/20/14	1.673		12.534	5.011	8.842	13.566	21.975	
08/23/14	0.911		10.323	2.695	7.008	19.935	19.89	
08/24/14			6.494	2.163	7.407	15.264	11.082	
08/18/15					64.246	82.019	69.852	100.642
08/19/15					5.858	42.905	25.429	29.64
08/20/15					134.799	117.752	112.079	180.628
08/21/15					12.368	16.823	19.001	18.29
08/22/15								
03/24/16	29.922							
04/19/16	10.044							
05/24/16	73.983							
06/16/16	3.029							

Date	Lake Coeur d'Alene Outlet SR-15	Mirabeau SR-8a	SR-8a Average
05/13/14	12.261, 53.177	7.652, 12.503	10.078
05/15/14	17.656, 19.793	37.458, 8.042	22.75
05/17/14	29.661, 34.225	44.347, 30.666	37.506
05/19/14		44.347, 34.961	39.654
05/21/14		43.045, 27.322	35.1835

Spokane River PCB Sampling Data
 Sample Concentrations Greater Than 3x Blank Concentration

Date	Lake Coeur d'Alene Outlet SR-15	Post Falls SR-12	Greenacres SR-9	Mirabeau SR-8a	Trent Bridge (Plante's Ferry) SR-7	Green Street Bridge SR-4	Spokane Gauge SR-3	Nine Mile Dam SR-1
05/13/14	37.269			14.252				
05/15/14	21.024			31.005				
05/17/14	44.388			45.322				
05/19/14				51.824				
05/21/14				36.618				
08/12/14	15.847	63.486	21.816		178.613		176.532	177.537
08/13/14								
08/14/14	47.358	10.37	9.241		122.223	188.762	169.064	200.436
08/15/14								
08/16/14	10.256	10.988	9.566		152.118	117.483	324.86	209.28
08/17/14								
08/18/14	2.939	10.832	41.166		411.683	128.868	216.297	190.803
08/19/14								
08/20/14	8.022	18.447	8.695		156.271	197.631	176.988	233.369
08/21/14								
08/22/14	1.673	6.83	1.089		87.563	62.98	403.528	84.854
08/23/14	0.911							
08/24/14		5.259	7.104		113.956	49.271	78.3	81.306
08/18/15			1.02	1.393	71.641	100.355	2.889	
08/19/15			6.613	16.648	167.575	52.162	1.861	
08/20/15			20.464	5.011	113.012	109.781	178.515	
08/21/15			108.139	8.385	119.714	173.835	170.28	
08/22/15			7.382	2.96	155.927	88.156	170.341	
03/24/16	31.342				74.641	95.71	85.655	111.212
04/19/16	29				10.87	73.805	55.079	65.848
05/24/16	78.643				150.479	131.392	122.259	196.728
06/16/16	3.029				64.498	77.583	62.561	62.33

Date	Lake Coeur d'Alene Outlet SR-15	SR-15 Average	Mirabeau SR-8a	SR-8a Average
05/13/14	13.581, 60.957	37.269	20.853, 7.652	14.252
05/15/14	17.656, 24.393	21.024	50.968, 11.042	31.005
05/17/14	44.231, 44.545	44.388	51.297, 39.346	45.322
05/19/14			60.397, 43.251	51.824
05/21/14			48.135, 31.102	36.618

Spokane River PCB Sampling Data
 Sample Concentrations Greater Than 10x Blank Concentration

Date	Lake Coeur d'Alene Outlet SR-15	Post Falls SR-12	Greenacres SR-9	Mirabeau SR-8a	Trent Bridge (Plante's Ferry) SR-7	Green Street Bridge SR-4	Spokane Gauge SR-3	Nine Mile Dam SR-1
05/13/14	32.119			13.247				
05/15/14	18.055			22.145				
05/17/14	31.283			36.643				
05/19/14				40.204				
05/21/14				34.048				
08/12/14	7.377	19.055	11.126		142.923		104.372	97.867
08/13/14								
08/14/14	13.303	10.37	9.241		22.853	102.145	28.834	33.708
08/15/14								
08/16/14	8.303	9.488	9.566		59.398	23.743	231.03	35.33
08/17/14								
08/18/14	2.939	10.832	25.376		335.923	22.908	61.821	37.71
08/19/14								
08/20/14	8.022	9.747	8.695		92.861	97.54	37.608	71.759
08/21/14								
08/22/14	1.673	5.868	1.089		7.054	8.567	127.298	11.801
08/23/14	0.911							
08/24/14		5.259	7.104		12.386	7.896	12.68	10.91
08/18/15			1.02		0.842	3.045	2.889	
08/19/15			6.613	1.393	23.625	1.562	1.861	
08/20/15			15.384	8.738	8.842	13.566	21.975	
08/21/15			10.323	5.011	7.008	19.935	19.89	
08/22/15			6.494	2.695	7.407	15.264	11.082	
03/24/16	29.086			2.163	63.076	80.309	68.242	97.462
04/19/16	15.499				5.017	46.045	23.489	27.63
05/24/16	72.193				131.479	115.232	109.669	175.628
06/16/16	3.029				12.368	16.823	19.001	18.29

Date	Lake Coeur d'Alene Outlet SR-15	SR-15 Average	Mirabeau SR-8a	SR-8a Average
05/13/14	12.261, 51.977	32.119	7.652, 18.842	13.247
05/15/14	17.005, 19.105	18.055	36.248, 8.042	22.145
05/17/14	28.341, 34.225	31.283	43.39, 29.896	36.643
05/19/14			46.587, 33.821	40.204
05/21/14			41.785, 26.312	34.048

Comments on the Draft NPDES Permit for Kaiser Aluminum Trentwood Works

Permit No. WA0000892

August 29, 2016

Comments on the Draft Permit

Section S2.A: Monitoring Schedule

The permit does not include a routine monitoring requirement for PCBs in the effluent from the black walnut shell (BWS) filter (internal outfall 006, see Page 12). This was one of the permitting recommendations submitted by the EPA to Ecology on July 13, 2015.¹ Monitoring is only required once, for the purpose of completing a permit application (Page 13).

According to the Fact Sheet (Page 10), the BWS filtration system was installed in 2003 to reduce PCBs discharged from the facility to the Spokane River. The EPA notes that monitoring of PCBs in the influent to the BWS filtration is required, ostensibly to ensure that the system does not exceed its design criteria.

The EPA also notes that the permit requires termination of the groundwater remediation flow (outfall 007) within two years of the effective date of the final permit. According to Table 2 of the Fact Sheet, all internal outfalls except 006 and 007 discharge to the wastewater lagoon. Thus, after the groundwater remediation discharge is terminated (and during periods of zero discharge from outfall 007 prior to that time), outfall 006 will be the only contributor to the final discharge, and monitoring for PCBs in the final effluent (outfall 001) would then be equivalent to monitoring for PCBs in the effluent from the BWS filtration system.

However, because of the difficulty in measuring PCBs at low concentrations and the potential for discharges from one internal outfall to dilute PCB congeners present in the other outfall, the EPA recommends that, at times when a discharge occurs from outfall 007, PCBs should be measured in outfalls 001, 006 and 007, rather than exclusively at outfalls 001 and 007 as proposed in the draft permit. After the discharge from outfall 007 is terminated, monitoring for PCBs at outfall 001 will be adequate.

The draft permit does not currently require sampling of the Spokane River for PCB congeners. Congener analysis is possible using EPA Method 1668C. The reason for recommending congener analysis is explained in the permitting recommendation submitted by the EPA to Ecology on July 13, 2015.² The EPA notes that the Fact Sheet states on Page 37 that the Spokane River Regional Toxics Task Force plans to characterize PCB concentrations in the Spokane River.

Characterizing PCB data is relevant for determining whether the Spokane River has met the water column concentration targets in the PCB on Pages 11 and 12 of the EPA's Plan for Addressing PCBs in the

¹Permitting Recommendations for the Spokane River Watershed. Included as Appendix B to EPA's Plan for Addressing PCBs in the Spokane River. July 14, 2015.

http://srrttf.org/wp-content/uploads/2015/07/Spokane-TMDLNotice_of_Filing_EPA-Response_to_Remand_filed_7.14.15.pdf

²Permitting Recommendations for the Spokane River Watershed. Included as Appendix B to EPA's Plan for Addressing PCBs in the Spokane River. July 14, 2015.

http://srrttf.org/wp-content/uploads/2015/07/Spokane-TMDLNotice_of_Filing_EPA-Response_to_Remand_filed_7.14.15.pdf

Spokane River (dated July 14, 2015). In the event that the Task Force does not continue to characterize PCB concentrations (which it is not required to do), and if Ecology does not require point source dischargers to the Spokane River to conduct monitoring for PCB congeners in the Spokane River (through a permit condition or other means), then EPA recommends that Ecology itself commit to monitoring PCB congeners in the Spokane River at a frequency adequate to assess both high and low river flow conditions.

Section S5: Schedule of compliance for total phosphorus, CBOD, and ammonia

In order to grant a compliance schedule for a water quality-based effluent limit (WQBEL), the permitting authority must require compliance as soon as possible (40 CFR 122.47(a)(1)). As a practical matter, this means that the permittee cannot immediately comply with the new effluent limitation on the effective date of the permit, because, if compliance can be achieved, then a compliance schedule is not available. See the May 10, 2007 memo from James A. Hanlon to the water division director of EPA Region 9³ and the *U.S. Environmental Protection Agency NPDES Permit Writers' Manual*⁴ at Section 9.1.3.

The draft permit includes performance-based interim average monthly effluent limits for phosphorus, ammonia and CBOD in Section S1.A.1, which are more stringent than the final limits in Section S5. The interim limits are smaller in magnitude and have shorter averaging periods (i.e., monthly instead of seasonal) than the final effluent limits. Since the performance-based interim limits are more stringent than the final WQBELs, Ecology cannot grant a compliance schedule to meet the final WQBELs. The permit should require compliance with the final WQBELs based on the TMDL WLAs immediately on the effective date of the final permit.

If Ecology feels that Kaiser should be required to complete the interim requirements in the compliance schedule (i.e., the annual status reports, engineering report, and installation and operation of phosphorus treatment technology), Ecology should require these actions as special conditions in the permit, or in a companion order, instead of requiring them as interim milestones in a compliance schedule.

Comments on the Fact Sheet

Page 11

The URL provided for the Spokane River Regional Toxics Task Force (SRRTTF) report of August 2015 sampling returns an error. The correct URL for this file, which is a presentation given to the Spokane River Regional Toxics Task Force by Dave Dilks of LimnoTech is:

http://srtrtf.org/wp-content/uploads/2015/11/SRRTTF_LimnoTech_TTWG_12_02_2015.pdf

However, the data in this presentation are available in a more final and complete format in the *DRAFT: Spokane River Regional Toxics Task Force 2015 Technical Activities Report: Continued Identification of Potential Unmonitored Dry Weather Sources of PCBs to the Spokane River*, dated June 30, 2016, which is available here:

http://srtrtf.org/wp-content/uploads/2015/08/SRRTTF_2015-Technical-Activities-Report_Draft_2016_06_30.pdf

³ “Compliance Schedules for Water Quality-Based Effluent Limitations in NPDES Permits”
https://www3.epa.gov/npdes/pubs/memo_complianceschedules_may07.pdf

⁴ <https://www.epa.gov/npdes/npdes-permit-writers-manual>

Please provide the URL for the draft technical activities report from June 2016 instead of the presentation from December 2015.

Table 3, Page 12

The upstream total PCB concentration is listed as 16.7 pg/L, and a footnote indicates that this is the maximum concentration from the 2015 synoptic sampling conducted by the SRRTTF at Mirabeau Park. However, the maximum result was actually 230 pg/L, measured on August 18, 2015.⁵ Although this appears to be an outlier, it is nonetheless incorrect to say that the maximum result was 16.7 pg/L, without mentioning the 230 pg/L result.

Under the State of Washington's permitting policies, the background concentration of a carcinogen like PCBs could be characterized using the geometric mean rather than the maximum; the geometric mean concentration measured at Mirabeau Park by the SRRTTF in August 2015 (including the 230 pg/L result) was 13.8 pg/L.

Table 3 should list the upstream geometric mean concentration of PCBs calculated from all available data.

Page 16

The Fact Sheet states that "water quality-based limits are calculated so that the effluent will comply with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC), or the National Toxics Rule (40 CFR 131.36)."

This facility discharges upstream from waters of the Spokane Tribe of Indians. The Spokane Tribe of Indians has treatment as a State under the Clean Water Act, and has established water quality standards that have been approved by the EPA and which are applicable to the Spokane River downstream from this facility.⁶ In some cases, the Spokane Tribe's water quality standards are more stringent than Washington's water quality standards, or the National Toxics Rule.

Federal regulations state that no permit may be issued when the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected States (40 CFR 122.4(d)). Ecology should analyze the discharge's effect upon downstream waters of the Spokane Tribe of Indians, and, if necessary, should establish WQBELs that do not cause, have the reasonable potential to cause, or contribute to non-attainment of the EPA-approved water quality standards of the Spokane Tribe of Indians, in addition to the Washington water and sediment quality standards and the National Toxics Rule.

⁵ DRAFT: Spokane River Regional Toxics Task Force 2015 Technical Activities Report: Continued Identification of Potential Unmonitored Dry Weather Sources of PCBs to the Spokane River.

http://srrttf.org/wp-content/uploads/2015/08/SRRTTF_2015-Technical-Activities-Report_Draft_2016_06_30.pdf

⁶ Tribes in Idaho, Washington and Oregon with EPA approved Water Quality Standards (WQS)

<https://yosemite.epa.gov/R10/WATER.NSF/Water+Quality+Standards/tribalWQStext>

Table 15, Page 24

There are USGS stations near the facility's outfall with recent daily flow data (albeit only for a short period of time). These are station numbers 12420500⁷, 12421000⁸ and 12421500⁹. These data should be compared to the estimated critical low flows presented in Table 15 and the estimated critical low flows should be adjusted if recent measurements indicate lower flows.

Page 25

EPA recommends that thermal plume temperatures drop to 32 °C (not 33 °C) within 2 seconds of plume travel to prevent lethality to salmonids.¹⁰

Page 33

The Fact Sheet states that, "Valid ambient background data were available for ammonia, arsenic, chromium, copper, mercury, and nickel (See Table 2). For antimony, iron, and manganese, Ecology assumed a background of zero."

Upstream water quality data for iron and manganese are available from the USGS National Water Information System. Data were collected at station #12420800, Spokane River at Sullivan Road Bridge near Trentwood, WA in 1999 and 2000.¹¹

⁷ USGS 12420500 Spokane River at Greenacres, WA. USGS National Water Information System: Web Interface. http://waterdata.usgs.gov/nwis/dv?referred_module=sw&site_no=12420500

⁸ USGS 12421000 Spokane River at Trent, WA. USGS National Water Information System: Web Interface. http://waterdata.usgs.gov/nwis/dv?referred_module=sw&site_no=12421000

⁹ USGS 12421500 Spokane River below Trent bridge near Spokane, WA. USGS National Water Information System: Web Interface. http://waterdata.usgs.gov/nwis/dv?referred_module=sw&site_no=12421500

¹⁰ EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA-910-B-03-002.

https://www3.epa.gov/region10/pdf/water/final_temperature_guidance_2003.pdf

¹¹ USGS 12420800 Spokane River At Sullivan Rd Br near Trentwood, WA http://nwis.waterdata.usgs.gov/usa/nwis/qwdata/?site_no=12420800