Spokane River Regional Toxics Task Force

January 31 Tech Track Data Synthesis Workshop Notes
Facilitated by Lisa Dally Wilson
Meeting Documents: http://srrttf.org/?p=12385

Attendees:

Voting Members and Alternates

Tom Agnew – Liberty Lake Sewer and Water District
Doug Krapas – Inland Empire Paper
Brent Downey – Kaiser Aluminum
Craig Borrenpohl, Alyssa Gersdorf – City of Post Falls
Rob Lindsay, Ben Brattebo – Spokane County
Jeff Donovan, Cadie Olsen, Trey George, Logan Callen – City of Spokane
Vikki Barthels – Spokane Regional Health District (SRHD)
Mike Anderson – City of Coeur d'Alene
Chris Donley – WA State Department of Fish & Wildlife
Holly Davies – WA State Department of Health

Advisors

Karl Rains, Jeremy Schmidt, Cheryl Niemi, Bill Fees, Brandee Era-Miller, Sandy Treccani, Will Hobbs, Cathrene Glick, Keith Seiders – Washington State Department of Ecology (Ecology)
Brian Nickel, Gunnar Johnson – Environmental Protection Agency (EPA)
Kristen Lowell – Idaho Department of Environmental Quality

Interested Parties

Dave Dilks – LimnoTech
Ben and Lara Floyd – White Bluffs Consulting (WBC)
Lisa Dally Wilson – Dally Environmental
Monica Ott, Chris Moan – Avista
Shawn Heinz, Jeff Schut – Gravity
Dr. Lisa Rodenburg – Rutgers University
Mike Petersen
Robert Mott – Mott Consulting
Gary Jones – United Printing Alliance
Kris Holm

Lisa Dally Wilson gave an introduction and went over the agenda. The focus of today's workshop is on the Mission Reach. In response to chat question, a brief recap as to why PCBs (especially PCB 11) appear in blanks and related information will be shared later in the day.

Management Objectives and Management Questions – Dave Dilks gave the presentation on management objectives and questions and the project area overview.

Overview of Project Area

Comments/Questions:

- Did Ecology have any water column data before 2014? *Dave said there are data on fish, water column and sediment that go back further and predate what is being shared; this is the more recent data.*

Summary/Presentation of Available Data by Media – Mission Reach (MR)

Water Column – Dave Dilks gave the presentation.

- Did you analyze homolog patterns of the grab samples for water? *Dave said it was done with the older data but not yet with the 2021 data. It is certainly something that can be done, and it should be a priority. Others agreed.*
- Jeff S (Gravity) said for the water quality transects that were collected, you noted that one sample had a high concentration was on the left bank. *Dave said at MR they were on the left bank.* Jeff said the SPMDs (semi-permeable membrane devices) around the Trent Avenue – Mission area were on the right bank. *Dave said the hottest sediment was on left bank and highest water column and biofilm was on right bank.*
- Was there any rain during the low flow SPMD deployment? *Dave said no - in one of the surveys in the past there was some localized storms, but this year was essentially dry weather and that would tend to rule out stormwater as the driving source.*

Sediment – Dave Dilks gave the presentation.

- There was a suggestion to use a river mile or a public geographic marker on the 2nd Trent site instead of naming a specific business. *Dave suggested calling it Trent Avenue – Mission area.*
- Brandee suggested conducting homolog analysis on the bed sediments also.

Biofilm – Brandee Era Miller gave the presentation.

- Dave said looking at Mission bridge, there we saw high concentration on the left bank of biofilm. Brandee said yes, the homolog patterns are showing different aroclors coming in. Dr. Rodenburg's PMF shows different aroclors in this location also. The weight of evidence is saying there are probably multiple aroclor sources coming. In. Dave said it's clear something is going on in MR.
- Do we know the various industrial uses of aroclor 1254 and 1260? *Dr. Rodenburg said in the chat that 1254 was used in a lot of things, including building material. Brandee said 1260 is used in things like transformers. I think of 1260 as more of a direct source. It would be good to talk about in more detail in the future.*
- Jeff S (Gravity) said it's also important in helping understand toxicity when using homologs. Heptas and tetras tend to be more toxic to humans. It is good to collect this information and not only sources and fingerprinting but to understand toxicity as well.
- There's a chart of uses on PDF page 494 of the ATSDR toxicological profile: https://www.atsdr.cdc.gov/toxprofiles/tp17.pdf
- Are there any groundwater monitoring wells adjacent to the river on the north bank in this area? *Dave said not that they are aware of. Perhaps a check of monitoring points in EIM could prove fruitful.*
- Aren't there wells at the Avista Voluntary Cleanup Program (VCP) site? Sandy said she thinks that's just north.
- Brian said I just took a quick look at EIM for PCBs in groundwater. Didn't see any results in the MR but I think Sandra is right that there are some at the Avista location just upstream of the E. Mission Ave. Bridge. I didn't check for method or aroclors vs. congeners. https://apps.ecology.wa.gov/eim/search/Detail/Detail.aspx?DetailType=Study&SystemProjectId=99971952 That groundwater PCB data at the Avista site is aroclor data. Method

8082A. Jeff D. said it looks like it's all non-detect. Monica Ott will follow up with information from Avista.

- This will be discussed later – Brandee said we can check groundwater….and could cover what is close by this area by looking at existing data in EIM.
- Just because there are monitoring points that exist doesn't mean they looked for PCBs or used a correct method for monitoring.
- Seems like very high hits/concentrations for 1254 to be simply ubiquitous, otherwise we would see it elsewhere.
- Jasper sniffed out a specific stormwater pipe that went in the river on the right bank and sniffed out PCBs in buildings in the area probably from paint and looks like those buildings drain into that stormwater pipe. We don't know what aroclors are there, but the right bank location tends to look a bit more like 1254 than 1260. With Dr. Rodenberg's PMF analysis, it indicates there is a mix of aroclors in the samples for this area.
- With the sediment sampling, were the sediments sieved to give a uniform sediment fraction? And if not, what was the variability in sediment grain size and carbon concentration across the samples? *Dave said they have the grain size analysis and Dave will follow up with Will to look at this and share an update with the group.*
- Are the sediment results normalized for grain size or carbon content? *Dave said no, they have not been yet.*
- Brandee said when they did source assessment in 2003, they took a sediment sample right near Gonzaga and it didn't look very high because it was mostly sand but when they normalized that location was the highest and normalizing to organic carbon can show what the highest concentrations are in the river, and it is an option to look at.

Fish – Dave Dilks gave the presentation.

- Shawn (Gravity) asked are the Rainbow trout (RBT) or whitefish also typically a bottom fish or in water column? I know whitefish aren't a bottom fish, but they may get something from a sediment pathway.
- Large scale suckers are benthic feeders, and they consume things in biofilm matrix and whitefish are exclusively invertebrate feeders and they will sometimes pick them off rocks but a lot of time picking out of the water column as they are washed downstream. They have a pretty specific diet and are a lot fattier and tend to accumulate more PCBs. Large scale suckers tend to live longer.
- Large Scale Suckers were analyzed as whole fish - not fillets.
- Jeff S (Gravity) asked are those concentrations normalized or are they total? *Dave said they are total.*
- You have the qualification that there are differences as Keith points out. Between the two Ecology studies there appeared to be a downward trend but due to variability amongst fish it is a stretch to draw trends using TF recent fish collection. Ecology is looking to repeat their study this year or next and can look at trends between comparable data sets.
- The question about lipid normalizing, we did not do that. The 2020 YOY RBT data are not comparable to data from 2005 and 2012 RBT data due to age, size, and whole vs fillet tissue types. Comparisons for YOY RBT will need to wait until that YOY sampling is repeated in the future. Not lipid normalized because there was not relationship between lipids and PCB concentration. There are a number of papers that question the use of the technique.

- Sandy said 8082 detection limits are a concern of the Task Force at other TCP sites, so I'd suggest it not be dismissed so lightly. There may in fact be wells contributing PCB source and although we have data there may be other groundwater sources north of the river.
- The Avista VCP does reference a "Transformer Oil Release"
- Brian said I see some monitoring wells in EIM (w/o PCB data) on the left/south bank of the river clustered around the North Hamilton Street bridge.
- Robert said I think this would be the time to review the question I raised. *This will be addressed when Dr. Rodenburg presents.*
- Regarding Jasper finding PCB on the walls of some of the buildings near the brewery, Shawn from Gravity wondered if you would see PCBs from paint chips in either water column or sediment and whether you would need to normalize sediment samples to organic carbon content. If PCBs are associated with paint chips, organic carbon normalizing may not be useful.
- Robert Mott commented while PCBs from paint chips definitely appear in sediments, my reading of the following is that they contribute to the water column and would be bio available. https://ui.adsabs.harvard.edu/abs/2017EGUGA..19.4792K/abstract

Analysis of Data in MR by Source/Pathway and Candidate Studies – Dave Dilks gave the presentation

Landside subsurface contamination/groundwater

Landside surface contamination/stormwater

- Cadie recommended using physical process related words such as "overland flow" and "vadose zone flow" rather than regulatory words like "stormwater" or "NPDES" if we conflate the two, we may miss important sources.
- Studies with monitoring wells near Hamilton St: (from earlier discussion) https://apps.ecology.wa.gov/eim/search/Detail/Detail.aspx?DetailType=Study&SystemProjectId=99971666 https://apps.ecology.wa.gov/eim/search/Detail/Detail.aspx?DetailType=Study&SystemProjectId=99972259
- Biofilms were collected at the end of the dry season. Is there flushing of the stormwater system and sediment build up during the dry months? *Trey George said there is no flushing that occurs. Our first fall rains are our washing.*
- Regarding the transformer oil leak near Avista, looking more at what is going on around Avista could be good. They had a discharge in the past.
- Where is the Springfield outfall in this reach? *Jeff D. said it's right at SR3A. It's another one of the small ones that Jasper identified.*
- Stormwater is a mechanism of transport, it's not a source. Saying that it is a source has profound regulatory implications. If we are doing science, we need to focus on what the sources are and then we can identify tools for addressing the source. *Dave said we try to distinguish between sources and delivery pathways, and we should clarify.*
- Brian said I agree with having those distinctions, but we don't have the luxury of starting with the sources for this project. There is regulated stormwater and regular stormwater and not all the water is regulated under the Clean Water Act.

- Are there any potential studies that can be done to fill gaps with the understanding of the routes and sources? Stormwater monitoring of Springfield outfall has come up and is at SR3A right bank. Also, we should conduct the landside contamination monitoring at Jasper-identified hot spots and a more detailed review of historical land use.
- When you said MS4, did you mean the larger stormwater outfalls? With the smaller ones how do they get cleaned and what is the process with maintaining? *Trey said with the systems that the city monitors we make sure the BMPs are being maintained and unless we are there at the time, it would not hit our radar.*
- Has the stormwater ever been flagged as an important source of Phosphorus under the TMDL? *Jeff D. said stormwater does have a Waste Load Allocation (for phosphorus, CBOD, NH3) under the Spokane River and Lake Spokane DO-TMDL.*
- Bill Fees said as a follow up on Hamilton St. bridge site – the majority of the site west of the bridge is fill materials so we have wells at different depths.
- Do we know where that water from the artesian well is coming from? *Jeff D. said he has never been able to find anything close to there when he has looked at City sewer/stormwater/water maps.*
- Is the one sample 1668 data so we can look at congener and homolog profile? *Dave said yes.*
- What were the materials used for the groundwater sampling that had the high hit? *Dave said it was a grab sample from the outflow itself.*
- Could a drive point piezometer be installed and left in ground for months where you could capture a longer period of events? *Jeff S. said if left in the ground it would have to go through permitting and would have to check with Ecology.*
- What about Mass Balance to look at higher hits around the artesian well? *Dave said it would be feasible to measure flow of well, but would it just be one piece of evidence of a much larger flow coming in? During Ecology fieldwork, it appears to be an old cistern well, but it was more a brick lined hand dug well and it was flowing over the whole area. There was deterioration and you could go in and develop a full weir in there.*
- Dave said further understanding of groundwater hydrology is important and needs to be fleshed out more.

Legacy historical contamination - Dave asked if the existing data say anything about aerial extent of bedded sediments in MR?

- Gravity said no, we didn't do any sub bottom sonar imaging as the water levels weren't high enough. We did more object detection and there is a lot of bedded sediment in the Trent – MR area. We can't quantify it but can look at it more. We were able to see a lot of sediment though.
- When will the Sanborn maps be available? *Not sure yet but there was discussion about who should keep them, and Karl was going to check in internally at Ecology.*
- Jeff S (Gravity) said the sediment sampling was minimal, and we do have some different techniques that can be used. With grain size and TOC that was mentioned, using existing data is an option. Dave confirmed that will happen.

Artificial fill

- Jeff S (Gravity) said one thing that we did in the field was trying to remove biofilm, so we were just sampling the brick material and we chose different kinds of them to sample. The asphalt was more difficult to get biofilm from.
- Were those composites or did you just grab one brick from one area? *There were multiple bricks from different areas.*

In-place buried objects

- Shawn (Gravity) said the magnetic anomalies were associated with different surface objects from side scan sonar that was done at the same time. The larger ones are closer to shore so easy to explore further. The next step would be to get in there with divers or use magnetometers even from shore.
- Do we know if these objects are buried beneath sediment? *Gravity - Some of them aren't very buried and the magnitude suggests they aren't very deep. Maybe in the top foot at a number of the locations but we didn't want to move anything yet. They put a dam structure by Trent Bridge which increased flow significantly and if they open it back up, we could extend the object detection survey downriver, but it was hazardous to work in at the time. Jeremy said he doesn't think there will be any more damming going on there.*
- Wouldn't it be easier to get a sample downstream of those objects to see if there are any high hits? *Gravity said it can be done at the deeper sites with a grab sampler to get sediment and biofilm.*
- WSDOT's website says in-water work was complete as of 12/2021. https://wsdot.wa.gov/construction-planning/search-projects/sr-290-spokane-river-east-trent-bridge#Timeline
- These magnetic anomalies - do we know they contain PCBs? *Dave said we don't know yet.*
- Gravity asked are these in any of the areas Jasper identified. *Dave said it looks like the one most downstream is close and Brandee said it could be. Lisa felt the object detection extended further downriver could be useful as it is in the vicinity of high hits near Trent Bridge-Mission Reach.*

PMF Assessment Summary – Dr. Rodenburg gave the presentation.

Comments/Questions:

- There are analyses that are showing significant levels in the blanks. Why is that? *Dr. Rodenburg said the best answer is no one can get a clean blank for PCBs. In the Spokane River they worked hard to drive blank levels down as low as possible. The issue is that PCBs are so ubiquitous as they were used everywhere, and no one can get a clean blank. Dave and I used different methods of correction, but we came to the same conclusion of what is going on in the river. Although the blanks are an issue in the water column, water column concentrations can be corroborated by biofilm, sediment and fish.* I'm not saying the PCBs aren't in river but by blank correcting you are losing signal data and losing ability to identify sources. *Dave agreed there are certain cases where we can't say what is happening.*
- Do you have any direct evidence that carbonless copy paper is in the recycling stream for paper? *No.*
- Please clarify the term "water column" regarding results: are results from whole water, filtered water, SPMDs, CLAMs, other sampling techniques? And are data from different

techniques being pooled (i.e., are they being deemed comparable?) *Dr. Rodenburg said when I use the term water column it's whole water column from synoptic surveys.*

- Any indication that microbial de-chlorination is taking place in the biofilms? *Not in the biofilm that I can see. It appears that the higher molecular weighted sources are what are accumulating in fish.*
- I'm not aware of a big, dissolved oxygen problem in the free-flowing parts of the river. *Dave said what we are seeing in the water column is spotty in sediments and biofilm. The ephemeral PCBs seems consistent with other media. Dr. Rodenburg said that makes it tough to track down; Ephemeral PCBs may indicate a groundwater source when conditions are such that groundwater is discharging to surface water.*
- Wastewater treatment facilities are installing tertiary treatment and the membranes are removing 100% of heavy molecular weight congeners. I think we will find there are lower molecular weight PCBs getting into the water from this.
- It seems evident in MR there is a lot of variability with the media and the seasons. *Lisa said with the SPMDs you get an integrated sample over time making this a good tool for using in areas with so much variability.*
- We often take results and go with them and make decisions that may not be the best using small samples. *Dr. Rodenburg said you have to look at it all holistically*. *Keith said the biofilms and SPMDs are short lived representations. The fish have a wide range of time frames they are representing that we have sampled. Different species metabolize PCBs differently too.*
- Regarding the factors in the analysis, can you use different factors from different sites interchangeably and use it with another media? *Dr. Rodenburg said you can certainly compare, and you can compare the metabolism of PCBs that show up in the fish. Things like de-chlorination seem different from place to place but the silicone seems to be consistent.*

Next Steps – Dave Dilks

Summation of knowns/unknowns

- Is the artesian well downstream or upstream of the hits observed in the biofilms? *Jeff D. said downstream of the highest biofilm concentrations.*
- There are a lot of stormwater outfalls that aren't monitored or part of any regulatory program and wonder if there is an inventory of all the outfalls for the river? Are they on a permit system or not? Same question goes for all of the groundwater wells in the area. Is there a map, nature, depth of aquifer, etc. *The city has a MS4 permit by Ecology and do have inventory of known outfalls and are inspected once a year. Lisa said most of the stormwater upstream of city is managed through dry wells, so the pathway is through groundwater.* Is there an effort to have some GIS tool that can map all of these futures? *Dave said no, the TF hasn't done that, and the city has their own action plan in place and controls them.* Does the TF have all of this information all in a GIS format that can be looked at together? *No, but it's a good idea.*
- Brian said I am gravitating to the subsurface contamination pathway given we are seeing these impacts at times when stormwater shouldn't be a large factor. It's a possibility we are seeing impact from groundwater and overlap from land side contamination also. Lisa asked if there was one aspect that should be considered. *Brian said furthering understanding of*

hydrology in this reach would be helpful as there is not a lot of resolution on groundwater interaction.

- I agree with Brian, given the seasonal variability and the ephemeral source comment and black hole of historical land use (that can be better understood with the Sanborn maps).
- Is it possible that the groundwater from the artesian well is the same water that may be influencing the biofilm that had very high PCBs? *Yes, that is a key question said Dave and we now have a single groundwater sample that we can use to compare the homolog patterns.*
- Brandee said I advocate follow up on Springfield stormwater system and getting a few grabs from the sediment in the storm drain system. There is definitely more than one source is my feeling on the MR. We are still missing something that could be subsurface. Jasper smelled PCBs in the water there.
- Lisa asked how people are feeling about object detection and next steps? *Brandee said we need to finish it and others agreed.*
- Mike P. said I agree with Brandee. Some of the vactor waste coming from drains in this area had relatively high PCB levels. Do you know specifically where the vactor waste samples were taken? *Les Stephens said the vactor waste was taken from a storm drain at Front Ave and Hogan St near Goodwill Industries, one block south of Trent Avenue.*
- The vactor waste storm drain - is that from one of those small storm drain systems like Springfield? *Brandee said I'm unsure what/where the vactor waste drain is. Can you clarify? Jasper only sniffed as far as the end of N. Erie St. and didn't go east towards the vactor waste site. I'm not 100% sure of what vactor waste is... is it from road cleaning or catch basin cleaning? Mike P. said vactor waste is what they pull out of storm drains, from a street corner for example.*
- Not sure how it compares to Springfield, but it is only 3 blocks from the river, and just south of the Trent Street Bridge. I wonder if Jasper checked out that area?
- Doesn't the water in an artesian well come from groundwater, not flow into it? *You are right. We want to use the well data as a measure of what is entering the river from groundwater.*
- Can you post a link to Dr. Rodenburg's 2020 Blank paper?

Review of candidate studies to address key unknowns – Lisa asked for additional suggestions to consider in the list of addressing key unknowns in the Mission Reach area of the Spokane river (list attached below at the end of meeting notes)

- Follow up of the object detection near Trent Bridge.
- Gathering sediment or biofilm samples downstream of objects detected.
- With respect to groundwater wells, doing more data mining to see what is already out there.
- With the Avista VCP, given non detects were determined using EPA Method 608, is there an opportunity to do more using EPA Method 1668 and hone in on what the groundwater contributions may be?
- As we consider other sites like near Mission Park, there may be some monitoring wells at some sites that are still present, and they may allow us to put instrumentation in them for water levels.

- Under further understanding, add consult with local experts (include info on basalt contact points and influence on groundwater).
- Sampling catch basin sediments near buildings Jasper identified as having PCBs to see if it is getting into stormwater systems nearby.
- Is it possible to tie clean up actions or types of oils that were stored to specific aroclors?
- In the MR, what is causing an increase in aroclors 1254 and 1260. Determine by honing in on the historical land use assessment.
- Please reach out to Monica Ott on any information that you need from Avista.
- We still have some soil samples from Trent Bridge project. *Jeff D said the TF funded $5,000 for samples on Trent Bridge project back in June.*

Lisa asked if there is anything that should be coming off the developed list?

- Artificial fill and the data collected hasn't shown anything.
- Projects 9 and 11 seem like different ways of doing the same thing and following up on anomalies found there so they can be merged.
- Do we really think we can calculate any accurate load from artesian well concentrations? Is that a groundwater movement towards the well then to the surface? *Dave said it may be difficult to come up with anything credible in the short term.* With considering other sites for data loggers, would we do this later after we see some results with current data loggers? *Yes, it would be done later.*

Lisa asked what are the two most important candidate studies to start on in the Mission Reach? A straw poll was done where everyone picked their top two and then the next three of priority. Numbers two and five were highest priority. Numbers 3, 12 and 9 were next with 11, 7 and 1 close behind. Lisa suggested combining numbers 1 and 2 (see description of numbered items below) and Brandee agreed that these should probably be phased where we sample stormwater from the outfall first, and then sample catch basins if stormwater shows PCBs. The information will be taken, and a plan of proposed projects will be vetted with the TTWG and then taken to the TF.

- Historically priorities have been based on funding, and we may realize we can still add more to what we want to do this year.
- These are recommendations but the TTWG should process it and prioritize. Lisa suggested coming up with a smaller work group to discuss as this is just a starting point. Five participants volunteered to be involved in the smaller work group including Brandee, Karl, Dave, Jeff and Bill.

Review of Candidate Studies to Address Key Unknowns in Mission Reach

- Landside Surface Contamination
    1. Stormwater monitoring of Springfield outfall
    2. Landside contamination monitoring at Jasper-identified hot spots, including sampling of catch-basins
- Landside Sub-surface Contamination

3. Follow-up monitoring of artesian well PCB concentration
4. Groundwater quality sampling via piezometers
5. Further our understanding of groundwater hydrology
    - Data mining (including Avista VCP)
    - Consider other sites with MWs for installation of data loggers (opportunistic)
    - Consult with local experts (include info on basalt contact)
    - 'In a perfect world' calculate loading based on groundwater dynamics and artesian well concentrations

- Legacy Contamination from Upstream Sources
    6. Mapping of the areal extent of depositional areas
    7. Sediment PCB monitoring with higher spatial resolution
        - Trent bridge sediment samples collected by ECY
- Contaminated River Fill
    8. Additional monitoring with greater spatial coverage of artificial fill PCB concentrations
- Buried PCB-Containing Objects
    9. Follow-up on magnetometer anomalies
        i. via video or diver survey to positively identify objects identified by magnetometer
        ii. Sediment or biofilm sampling immediately downstream of objects detected
    10. Follow-up object detection near Trent Bridge
- Multi-purpose Studies
    11. Additional Biofilm Monitoring
    12. More rigorous review of historical land use
        - Including uses of aroclors, cleanup levels, etc.