Smurfit-Stone Mill Frenchtown Site - Response to Public Comments on the

August 2021 Smurfit-Stone Frenchtown Mill Site Natural Resource Draft Damage Assessment Plan

Prepared by the Smurfit-Stone Mill Frenchtown Site Trustees

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Comment Summary and Response

The State of Montana through the Natural Resource Damage Program (NRDP), on behalf of the Smurfit-Stone Mill Frenchtown Site Trustees published the draft Smurfit-Stone Frenchtown Mill Site Natural Resource Damage Assessment Plan (Assessment Plan) on September 26, 2021. A public comment period was held for the Assessment Plan in accordance with 43 CFR § 11.32 and § 75-10-713, MCA, from September 26, 2021, through November 26, 2021. In total, 36 individual comments were received. The majority of comments were from private citizens (25 comments). Comments were also received from Missoula City-County Health Department, Missoula Conservation District, Westslope Chapter of Trout Unlimited (TU), Montana TU, Bitterroot TU, the Frenchtown Smurfit Community Advisory Group (CAG), the Clark Fork Coalition (CFC), the Potentially Responsible Parties (PRPs) represented by Integral Consulting Inc. (Integral) and NewFields, Hellgate Hunters and Anglers, and the Missoula County Commissioners. A list of individual comments is included as Appendix A- List of Comments. The individual comments are included as Appendix B – Individual Comments.

In accordance with 43 CFR § 11.32 "Any comments concerning the Assessment Plan received from identified potentially responsible parties, other natural resource trustees, other affected Federal or State agencies or Indian tribes, and any other interested members of the public, together with responses to those comments, shall be included as part of the Report of Assessment, described in §11.90 of this part." We encourage all interested parties to review these comments.

Comments on the Assessment Plan generally fall into two categories; comments in support of the Assessment approach as presented in the Assessment Plan, and comments not in support of the approach.

The Trustees appreciate the support of the Assessment Plan. The Trustees encourage any individuals, organizations or stakeholders who are not involved with the Smurfit-Stone Community Advisory Group (CAG) to become involved. The Smurfit-Stone CAG is a diverse representation of area residents, nearby landowners, and community interests. All CAG meetings are open to the public and any interested party is welcome to participate in the CAG. The purpose of the CAG is to provide a public forum for community members to present and discuss their needs and concerns related to activities at the Smurfit-Stone Site. For more information on the Smurfit CAG and to become involved please visit:
https://www.facebook.com/FrenchtownCAG/

On November 24, 2021, Integral and NewFields (Integral Consulting and NewFields, 2021) jointly submitted comments on behalf of the PRPs. They included two attachments: an Integral Consulting (2021) report on polychlorinated biphenyl (PCB) source evaluation, prepared for the PRPs (specifically, WestRock and International Paper) in June; and a NewFields technical memorandum to Allie Archer of the U.S. Environmental Protection Agency (EPA) on the adequacy of remedial investigation surface water and groundwater data.

In the following sections, the comments are shown in italics, with the response following each comment. The comments from the PRPs were not numbered. Many comments included multiple

bullets; the bullets and bullet levels are reproduced herein. We have added comment numbers so we can refer to earlier responses when addressing redundant comments. The references from Integral Consulting and NewFields (2021) have not been copied into this response to comments.

1. Responses to General Comments

The comments from Integral and NewFields include general comments in a cover letter, followed by comments labeled as, "technical comments." This section provides responses to the general comments.

- *Comment 1 (p. 1): The NRDA Plan is premature and deficient. The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) NRDA regulations are intended to provide a procedure for determining compensation for injuries to natural resources that "have not been nor are expected to be addressed by response actions conducted pursuant to the NCP" (43 Code of Federal Regulations [CFR] § 11.10). If conducted prior to the U.S. Environmental Protection Agency's (EPA) record of decision for the Site, an NRDA cannot properly reflect the effects of any remedy.*

Natural resource damages incorporate past, present, and continuing future injuries to natural resources until the resources are restored to baseline, as well as injuries resulting from the remediation. While a final determination of damages may be premature when the Trustees do not know the remedy, nothing precludes the Trustees from assessing past and current hazardous substance releases and injuries while the remedial investigation (RI) and feasibility study (FS) are ongoing. In fact, it can be cost-effective to conduct an injury assessment when the RI is ongoing. Regulators can use the Trustees' data to inform their remedial decisions, just as the Trustees use the RI data to inform the injury assessment.

- *Comment 2 (p. 1): Even if there are some situations where early assessment may be warranted, the remedial investigation (RI) for the Site is not sufficiently advanced to support the NRDA.*

The Trustees agree that the RI for the Site does not sufficiently support the NRDA. Therefore, additional studies are required. The EPA and the potentially responsible parties (PRPs) have not proposed work plans to address the ongoing data gaps identified by the Trustees. If such studies were to occur as part of the RI, and the Trustees were invited to participate in the design and oversight of the studies, they would reconsider conducting the studies proposed in the Assessment Plan.

- *Comment 3 (p. 1): In addition, the NRDA Plan was clearly developed prior to and without reasonable consideration of EPA's final Site baseline ecological risk assessment (BERA) or baseline human health risk assessments (BHHRAs). A stated goal of the NRDA Plan is to increase efficiency by coordinating with the remedial investigation and feasibility study (RI/FS) process. Proposal of additional studies without full consideration of the RI nature and extent evaluations, or without consultation of the final risk*

assessment conclusions, and before a feasibility study has been performed, is contrary to this goal.

The RI/FS will not address the data gaps that the Trustees have proposed to address. The Trustees remain engaged with the PRPs and the cleanup agencies (EPA and Montana DEQ) in the RI process. If any of the data gaps identified in the Assessment Plan are addressed in future RI studies, and the EPA and the PRPs coordinate sufficiently with the Trustees to ensure that the studies will address the data gaps that the Trustees identified, the Trustees will not conduct a redundant study. Thus far, the Trustees have seen no indication that the data gaps identified in the Assessment Plan will be addressed in the RI/FS.

- *Comment 4 (p. 1): The NRDA Plan states that studies done to address exposure and injury determination should also be useful for injury quantification and damage determination. The latter requires identification of the natural resources services that may be impaired and selection of indicators of (metrics for) those services. Without specification of services and their metrics, it is not possible for Trustees or stakeholders to determine if the proposed studies are necessary or appropriate to support decision-making regarding any restoration that may be needed. The NRDA Plan is incomplete by failing to identify the impacted natural resource services (and associated metrics) and failing to specify how the proposed analyses and studies will inform potential service loss and restoration planning.*

In a NRDA, the Trustees follow the process outlined in 43 C.F.R. Part 11, which consists of three phases: injury determination, injury quantification, and then damage determination. This process is clearly outlined in the Assessment Plan. The Trustees must determine sequentially if a release of a hazardous substance has occurred, there is a pathway from the release site to Trustee natural resources, those resources have been exposed to the hazardous substances, and the exposure has caused injuries. After the Trustees determine that an injury has occurred, they then quantify the spatial and temporal extent of that injury (including a baseline service determination and resource recoverability analysis), the natural resource services that were lost, and the restoration and damages required to make the public whole. At this Site, the Trustees still need to address data gaps in releases, pathways, exposure, and injury. Specifying lost services and metrics for quantifying those services before these data gaps are addressed is premature.

2. Responses to Technical Comments

2.1 Comments on Source Pathways, Receptors, and Baseline Conditions

The NRDA Plan contains presumptive statements about the fate and transport of contaminants, linking the Site to the Clark Fork River. Source, pathway, and receptor evaluations are underway and will be reported in the Site RI. Therefore, the presumptive statements are premature, potentially misleading and inaccurate, and additional data collection as part of an NRDA Plan is not necessary at this stage.

- *The NRDA Plan is premature/unwarranted prior to completion of the RI/FS and finalization of the BERA and BHHRA.*

- *Comment 5 (p. 2): As shown in the RI Workplan, 10 subsequent workplan addenda, and numerous data summary and data analysis reports (USEPA 2021a), EPA has evaluated and addressed data gaps in the RI data set and approved these data for use in the RI. These data and analyses are in progress as part of the RI report. The Trustees' presentation of the sources and pathways in the NRDA Plan are premature and should instead incorporate the RI findings.*

The Trustees have reviewed and commented on the RI Work Plan and the addenda. To date, the existing data and work plans do not address the data gaps that the Trustees identified in the Assessment Plan.

- *Comment 6 (p. 2): As provided in 43 CFR § 11.13(e)(1), injury determination includes determining the pathway, or route, through which the hazardous substances were transported from sources to the injured resource. This assessment is currently being evaluated as part of the RI/FS process.*

The Trustees intend to use all available data from the RI. To date, the existing data and work plans do not address the data gaps that the Trustees identified in the Assessment Plan.

- *Comment 7 (p. 2): The NRDA Plan does not include consideration of the sources, pathways, and receptors presented by EPA in the final BERA or draft BHHRA nor the risk assessment conclusions. The NRDA Plan presents or proposes to perform separate, duplicative analyses, which is in opposition to NRDA regulations to avoid duplication and reduce costs as stated in in 43 CFR § 11.31(a)(3). For instance, hazardous substances, as defined by the Trustees in Table 3.1, misrepresents the current understanding of chemicals of potential concern (COPCs) at the Site. EPA's final BERA (USEPA 2021b), the previous draft BERA (USEPA 2020a), nor the draft BHHRA (USEPA 2020b,c) were consulted/cited in the creation of this table.*

The Trustees disagree that the proposed studies are duplicative. The Trustees have reviewed all RI documents and provided comments on work plans in an attempt to have the Trustees' identified data gaps addressed in the RI. The Trustees have also coordinated the proposed Assessment Plan with the RI/FS and other investigations, per 43 CFR § 11.31(a)(3). If the Trustees receive data originating from the RI process that are otherwise proposed to be collected in the Assessment Plan, and these data were collected using the methods specified in the Plan, the Trustees will re-evaluate the need for the study.

The goals of a risk assessment and a NRDA are different, and the questions that the cleanup Agencies need to answer when determining a remedy are often different than the questions Trustees need to answer to address natural resource damage liability. It is common for Trustees to conduct additional studies beyond the RI process.

Table 3.1 of the Assessment Plan provides a list of hazardous substances detected at the Site. It is not a list of COPCs from the risk assessment. It cites several documents that were published before the BERA, including the Screening Level Ecological Risk Assessment (SLERA) and the OU1 Human Health Risk Assessment (HHRA). The Trustees did not consult or cite the final

BERA because it was released two months after the publication of the draft Assessment Plan. However, the Trustees reviewed and commented on the draft BERA. The conclusions of the final BERA are substantially the same as the draft.

  - *Comment 8 (pp. 2–3): Surface water data collected show that: 1) the quality of the Clark Fork River is not degraded (as defined by State law) by the Site, and 2) the quality of the Clark Fork River meets all beneficial uses above, adjacent, and downstream of the Site (NewFields 2021a).*

Surface water data are from grab samples that do not provide the detection limits or time integration that can be achieved with passive sampling devices. The Trustees have determined that the grab sample data are not definitive for the assessment of compounds such as coplanar PCBs and dioxins.

  - *Comment 9 (p. 3): EPA stated in the draft BHHRA: "Exposure to sediments and surface waters of on-Site creeks or the CFR [Clark Fork River] appear to be influenced significantly by either naturally occurring concentrations or other anthropogenic sources as evidenced by statistical tests that found concentration distributions between Site and upstream samples to be equivalent" (USEPA 2020c, p. 61).*

The Trustees reviewed and commented on the draft BHHRA. The Trustees believe that existing data gaps need be addressed before such conclusions can be made. It is possible that the Trustees will reach a similar conclusion after addressing the data gaps. The proposed NRDA studies do not presuppose an outcome.

- *The NRDA Plan does not acknowledge all data or Site information collected to date.*
  - *Comment 10 (p. 3): Numerous shallow and deep monitoring wells are located downgradient of the former wastewater system and along the length of the Clark Fork River boundary (NewFields 2021a,b). Monitoring results show that dioxins, arsenic, manganese, and iron are the primary COPCs in shallow groundwater. Polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and other metals are not present in shallow groundwater onsite at concentrations above risk-based standards or background levels (NewFields 2021b; USEPA 2020a,b,c). Despite the presence of certain COPCs in shallow groundwater, only manganese has been observed in the CFR at concentrations above a secondary maximum contaminant level (SMCL). SMCLs are not enforceable and are used to provide guidance for aesthetic reasons (i.e., taste and color). Manganese has been observed elsewhere upgradient and downgradient from the mill at levels above the SMCL (NewFields 2020; Brumbaugh et al. 1994).*

The Trustees analyzed the available data from the EPA SCRIBE database and presented the data in the Assessment Plan. Concentrations of dioxins exceed state water quality standards in shallow groundwater, using grab sampling. The Trustees have proposed sampling groundwater using passive sampling devices, which are designed to provide a time-integrated sample with lower detection limits. These data should be collected and analyzed before concluding that

coplanar PCBs and dioxins are not being released to the Clark Fork River at concentrations sufficient to cause injury.

  - *Comment 11 (p. 3): The Trustees' pathway assessment is incomplete and does not include consideration for the Site's distinctive physical features. For example, the NRDA Plan states, "In addition, hazardous substances in ponds, the industrial area, landfill areas, the land farm area, and contaminated soils may be transported to the Clark Fork River and nearby creeks by surface runoff during spring snowmelt, seasonal precipitation, and storm events." Misleading statements like this imply that surface water simply transfers COPCs into the Clark Fork River with no consideration of the impact from the Site's distinctive physical features such as berms, settling ponds, or other Site features, which collectively make overland transport an incomplete or insignificant potential pathway. Furthermore, the treated water stored in the holding ponds adjacent to the Clark Fork River met all Montana Pollution Discharge Elimination System (MPDES) criteria for discharge to the Clark Fork River during prescribed times of year (SSC 2010).*

The comment quotes a section from the Assessment Plan that concludes, "the extent of downstream transport and exposure is not yet known." The Trustees are aware that the floodplain is a former water treatment system with berms and settling ponds, and that existing data may not confirm a pathway to the Clark Fork River. The Trustees disagree that the existing floodplain pathway data are conclusive and therefore no additional data should be collected.

The MPDES permit criteria included color and temperature. The permit did not require the monitoring of dioxins/furans or coplanar PCBs. When EPA and the paper industry conducted their study of 104 kraft paper mills in the late 1980s (U.S. EPA, 1990), they detected 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) in the Frenchtown Mill effluent. This study indicates that it is certainly possible, and even likely, that dioxins/furans and/or coplanar PCBs will be found at this site.

- *The analyses presented in the NRDA Plan misinterpret the data and mischaracterize the Site habitat and features.*

  - *Comment 12 (pp. 3–4): The Trustees' potential identified pathways (Figure 5.1 and associated text) appear to ignore and are inconsistent with the findings of the comprehensive BERA process that has already taken place, and do not match EPA's final BERAs for OU1 (USEPA 2017) or OU2 and OU3 (USEPA 2021b) (e.g., compare to Figures 2.7A and 2.7B in the OU2/3 BERA and Figure 2-4 in the OU1 BERA). As an example, the Trustees suggest groundwater as a potential pathway while final BERAs indicate a lack of any complete groundwater pathways at the Site.*

The Trustees reviewed and commented on the pathways analyses in the BERA and disagree with some of the conclusions. None of the groundwater data from the Site were collected using passive or high-volume sampling. The grab samples are not sufficient to characterize the potential transport of hydrophobic compounds such as dioxins and coplanar PCBs. Despite the limitations, dioxins have been detected above water quality standards in numerous groundwater

samples in the floodplain, suggesting that a complete groundwater pathway to the Clark Fork River may exist.

- *Comment 13 (p. 4): Statements such as "The highest concentrations of both arsenic and manganese are downgradient of the primary and secondary water treatment ponds (NewFields 2017), suggesting that the Site wastewater stream is the source of the contamination" are misleading, given that no Site wastewater stream has been generated or discharged for more than 10 years. When used out of context, this statement grossly oversimplifies the source, transport and fate of arsenic and manganese at the Site. The source, transport, and fate of these COPCs are detailed in NewFields (2020).*

The Assessment Plan did not make definitive statements about sources and pathways. The Trustees merely summarized existing information about the location of elevated arsenic and manganese concentrations, consistent with NewFields (2020, p. 25): "Groundwater with arsenic concentrations elevated above background is predominantly confined to Unit 1 groundwater underlying the west-central portion of OU2 near NFMW15 and NFMW16 and downgradient of the primary and secondary treatment ponds." Arsenic concentrations are not above background upgradient of the treatment ponds and are above background downgradient of the treatment ponds. The Trustees do not agree that it is misleading to suggest that the arsenic may have come from the treatment ponds.

- *Comment 14 (p. 4): Fish tissues are not appropriate for forensic analyses because fish: 1) take up different congeners into their tissues at different rates, and 2) metabolize congeners at different rates. Rates of uptake vary among individual dioxins and furans and dioxin-like PCB congeners by both vertebrates and invertebrates. These rates are controlled to a large extent by the size of the molecule, whereby smaller, lower-chlorinated congeners are taken up more readily across gill and gut membranes that are the larger, more chlorinated congeners (Opperhuizen and Sijm 1990). Dioxins and furans and dioxin-like PCBs can also be metabolized and excreted, and this also occurs at different rates for different congeners (Hu and Bunce 1999; Nichols et al. 1998). Elimination rates of tetrachlorinated congeners are lower than those of more chlorinated congeners (e.g., Niimi 1996). Finally, dioxins and furans do not biomagnify, unlike PCBs (Naito et al. 2003; Wan et al. 2005; Broman et al. 1992). These factors taken together make fish tissue a poor medium for source valuation of dioxins and furans and other dioxin-like PCBs. Therefore, any analysis based on congener profiles in fish tissue may not match the congener profile to which they were exposed.*

The Trustees are aware of both the utility and limitations of congener analyses in fish tissues. As noted in the Assessment Plan, the Trustees are evaluating multiple lines of evidence to determine potential sources, pathways, and injuries from coplanar PCB and dioxin/furan releases into the Clark Fork River. The Trustees also note that in some cases sources and pathways can be confirmed through observed differences in congener patterns, when these differences align with expected congener-specific differences in uptake, metabolism, excretion, and other factors described in the comment.

- *Comment 15 (p. 4): The NRDA Plan improperly suggests that data for chemicals in fish tissue from the Noxon Reservoir indicate exposure from Site-related chemicals, while failing to acknowledge the uncertainties associated with interpreting congener profiles in fish tissue. As previously mentioned, fish tissue data are not appropriate for forensic analysis. The NRDA Plan additionally fails to establish a pathway from the Site to the Noxon Reservoir or to any locations in the Clark Fork River downstream of the Site. Conclusions presented in the NRDA Plan using congener profiles in fish tissues to establish a connection to the Site are not supportable.*

The Trustees did not present conclusions about the Site as a source of coplanar PCBs and/or dioxins/furans. If the Trustees had sufficient data to reach these conclusions, additional studies would not be included in the Assessment Plan. The data presented in the Assessment Plan simply provide a context for why the Trustees determined that additional assessment work is required. In addition, as noted in the previous comment, the Trustees disagree with statements that imply that fish tissue congener data are categorically not useful.

- *Comment 16 (pp. 4–5): The NRDA Plan attempts to establish a gradient of tissue concentrations of dioxins and furans and PCBs that are higher downstream of the Site than upstream. This is not technically defensible for the following reasons:*
  - *First, there is no meaningful analysis presented that demonstrated concentration levels are statistically different between sample areas.*
  - *Second, Abt uses data on chemical concentrations in fish tissues sampled from populations of fish species with substantial home ranges. With this information, it cannot be concluded that fish with elevated tissue concentrations collected at a given location represent solely the concentration at the collection point. The movement of fish and their integration of exposure as they migrate confound interpretations of chemical spatial gradients and undermines this method for establishing the Site as a source.*
  - *Third, confounding factors such as differences in rates of uptake, metabolism, and depuration of chemicals by fish are not considered. Lastly, chemical bioaccumulation rates within fish are highly influenced by fish age, size, species, food web, home range, and dietary sources of contaminants. Integral Consulting Inc. (Integral) evaluated spatial patterns of PCBs in the rainbow trout tissue data generated by EPA's Team in 2018 and 2019.1 Spatial patterns of PCBs in rainbow trout show that total PCB concentrations in both fillet and carcass tissue are higher in Missoula, Council Grove, Frenchtown, and St. Regis than in the locations upstream of Missoula (Clinton and Greenough), and in locations upstream of the confluence of the Bitterroot River and Clark Fork River (Florence). The highest concentration of PCBs in rainbow trout fillet tissue was in 2018 at Council Grove (Integral 2021). However, many of the PCB concentrations in upstream samples are above fish consumption advisory (FCA) thresholds, indicating that other sources exist and that there is no incremental effect of the Site on indicators of injury. Integral's "Potential Sources of PCBs in Clark Fork River Fish" report*

(Integral 2021) provides additional analyses and discussion of potential spatial trends in fish tissue PCB concentrations.

The comment notes that the Trustees should not draw conclusions about sources of contaminants from the existing fish data, because the fish sampled have substantial home ranges. The Trustees agree that the existing data are inconclusive, for multiple reasons. The commenter also concludes that other contaminant sources exist and that there is no incremental effect from the Site. The Trustees disagree and as noted, have determined that the existing data are insufficient to draw such a conclusion. Additional data are required, which the Trustees have proposed to collect in this Assessment Plan.

- *Comment 17 (p. 5): The NRDA Plan states: "…the 2019 data generally show an increasing trend in TEQ concentrations, including higher dioxins/furans and higher dioxin-like PCBs in trout from St. Regis downstream of the Site [see Figure 4.10]." A similar statement appears on page 69: "fish tissue data suggest an increase in both dioxins/furans and coplanar PCBs downstream of the Site, near St. Regis." Discerning trends from individual congeners that have been summed based on a toxicity equivalency are fraught with interpretational challenges and are misleading. Furthermore, evaluation of fish tissue impacts by toxicity equivalence for dioxins and furans (TEQD/F) concentrations was considered in the BHHRA and hazards were found to be less than the EPA threshold of 1 for both the recreational and tribal fisher receptors. Specifically, the report indicates: "As was observed for the recreational fisher, non-cancer hazards from ingesting TEQ in fish tissues are not above the UESEPA guidelines (HQ ≤ 1E+100) when based only on dioxin/furan congeners" (USEPA 2020b).*

The Trustees agree that the interpretation of the existing data is challenging. Therefore, the Trustees have proposed collecting additional data to try to understand why the concentrations of PCBs and dioxins increase downstream of the Site.

The Trustees reviewed and commented on the draft BHHRA. The risk to a recreational fisher is not relevant to the observation that dioxin/furan toxic equivalency (TEQ) concentrations increase downstream of the Site.

- *Comment 18 (pp. 5–6): The NRDA Plan contains inaccurate and contradictory descriptions of Site pond habitats and characteristics. For example, the NRDA Plan defines surface water as "the waters of the United States, including the sediments suspended in water or lying on the bank, bed, or shoreline… This term does not include ground water or water or sediments in ponds, lakes, or reservoirs designed for waste treatment" [43 CFR § 11.14 (pp)]. The NRDA Plan further asserts: "Hundreds of acres of holding ponds in the OU3 floodplain received Site water after the point of compliance for wastewater treatment. Water and sediments in these OU3 holding ponds meet the definition of surface water resources." However, no justification is given as to why some ponds should be considered surface water while other ponds should not. In fact, the EPA screening level ecological risk assessment (SLERA) does define OU3 uplands as wastewater treatment ponds (USEPA 2017). Without clear delineation on which ponds meet the definition of wastewater treatment, these statements are misleading.*

The Trustees are evaluating trusteeship of surface water resources in OU2 and OU3 and any appropriate changes to the definition of surface water will be made in the Plan, however, any biota exposed to hazardous substances in the ponds are Trustee resources regardless of whether the treatment system was operational. Similarly, the ponds may have been a pathway for contamination to the groundwater and need to be described in the Assessment Plan for this reason.

- *Comment 19 (p. 6): The Trustees refer to several Site ponds as seasonal wetlands; however, EPA has not identified any jurisdictional wetlands onsite. The BERA does state: "Ponds containing water for most or all of the year currently are occupied by early successional stage wetland plant communities, including algae, and some floating and some emergent aquatic plants. Ponds are used by a variety of ducks, geese, and other waterfowl (e.g., grebes). They may also seasonally attract wading birds and shorebirds, amphibians, and reptiles" (USEPA 2021b). However, these ponds are manmade and have generally low quality habitats with low benthic macroinvertebrate populations and limited vegetation and, therefore, low service value.*

The description of the ponds as seasonal wetlands is consistent with the quote from the BERA cited in the comment. The Assessment Plan contains no discussion of habitat quality or services. If the Trustees find hazardous substance exposure and injuries to natural resources in the ponds, they will determine the habitat quality and lost services after the assessment planning phase, which is consistent with the CERCLA Natural Resource Damage Assessment and Restoration regulations at 43 CFR Part 11.

- *The NRDA Plan cites data that do not meet EPA's approved data quality objectives.*
  - *Comment 20 (p. 6): The Trustees acknowledge that the URS (2012) groundwater data were rejected by EPA (because the data did not meet data quality objectives as outlined in the EPA-approved quality assurance project plan [QAPP]); however, the Trustees later go on to cite findings from this report including elevated arsenic and manganese concentrations (that were discounted and excluded from the RI data set). In contrast, the Trustees do not cite the extensive RI data set that did comply with EPA data quality objectives.*

The assertion that the Trustees do not cite the extensive RI data set is false. The Assessment Plan extensively cites RI data and refers to the use of the data set in the EPA's Scribe database in multiple locations. The vast majority of the data that are presented and cited in the Assessment Plan are data from the Scribe database that were collected after URS (2012).

The Trustees are aware of the data quality issues in URS (2012). However, subsequent RI studies did not collect new data at all of the locations where URS collected data, and some of these URS data identified potential contamination issues. The Trustees acknowledge that the URS data are less reliable than subsequent RI data, but they do not agree that all URS (2012) data should be ignored, particularly when those data identify potential contamination issues that were not subsequently confirmed or refuted with follow-up studies.

The NRDA Plan does not sufficiently discuss assessment of baseline and the available data already collected within the region for interpreting baseline conditions.

- *Comment 21 (p. 6): The definition of baseline is narrowly defined as non-chemical stressors. This is an incomplete definition and is not reflective of the CERCLA regulations, which include consideration of other natural and anthropogenic sources of chemicals within the region.*

Section 5.4.2 of the Assessment Plan provides the definition of baseline from the CERCLA NRDAR regulations and presents in detail the guidance for determining baseline conditions. However, in reviewing the comment, the Trustees noted that the entire definition of "baseline" was not included in the Assessment Plan, because "under investigation" was not included in the quotation. The full definition of "baseline" has been included in the Assessment Plan. Baseline is not defined as non-chemical stressors in the Assessment Plan. The Assessment Plan refers to conditions absent the releases of hazardous substances. Consistent with all damage assessments conducted pursuant to the CERCLA NRDAR regulations, this means absent the releases of hazardous substances from this Site, not the absence of hazardous substances globally. Having worked on the assessment of hazardous substances in the upper Clark Fork River basin for over 30 years, the Trustees are aware of the existence of other sources of hazardous substances.

- *EPA has identified appropriate baseline conditions for the RI; there is no discussion of these data in the NRDA Plan.*

    - *Comment 22 (pp. 6–7): The NRDA Plan relies heavily upon general references documenting conditions in the region and broader Site vicinity, implying the mill is responsible for those conditions, without Site-specific evidence. However, the mill complied with emission requirements pursuant to a Title V operating permit throughout its operating history. Also, EPA made conclusions to the contrary, for example, EPA's "Smurfit Stone Mill Site Air Deposition Fact Sheet" (USEPA 2021c) states: "EPA has concluded that the potential impacts to the surrounding environment from past emission from the Mill are very low for the following reasons:" 1) extensive sampling in 2015 along the prevailing wind pathways from the boiler stacks indicated that "No pollutants were detected at concentrations of concern to human health"; 2) permitted burning of primary sludge materials was concluded by Montana Department of Environmental Quality to not result in adverse impacts to human health (MDEQ 1995); 3) boiler emissions comply with proposed standards for dioxin emission; and 4) dioxin and furans in soils surrounding Missoula are typical of rural areas elsewhere in the U.S. and well below other urban areas.*

The Trustees do not dispute the air deposition conclusions from EPA, which focused on whether past emissions posed a risk to human health. The Assessment Plan focuses on the assessment of waterborne pathways to natural resources.

    - *Comment 23 (p. 7): Numerous sources of dioxins/furans, coplanar PCBs, and other contaminants have contributed to concentrations of these constituents in the Clark Fork River and elsewhere in the Site vicinity, which are evident in the background data set EPA compiled to support the draft BERA and BHHRA. For example, all 11 chemicals of potential ecological concern (COPECs) in sediment of the Clark Fork River were statistically similar to or less than concentrations upstream of the Site. Comparisons of creek sediments, surface (Clark Fork River*

and creeks) and OU2/OU3 soils also determined that Site COPEC concentrations were equal to or less than background for some constituents detected at the Site (USEPA 2020a). In EPA's final BERA (USEPA 2021b), comparison of Site samples to representative background data were removed but delayed to the RI. In the BERA response to comments (USEPA 2021d), EPA states: "Although conducting a comparison to background concentrations was included in the BERA Work Plan as part of the COPEC refinement (EPA 2018), upon further consideration of existing guidance it was determined that comparisons with background levels should not be used to remove contaminants of concern from further evaluation owing to the need to fully characterize site risks (EPA 2001). . . Comparisons of site concentrations to background concentrations should still be considered within the RI outside of the risk assessment to provide risk managers to better characterize the results presented in the risk assessment." Baseline anthropogenic conditions within the region must also be considered.

The comment cites the final BERA and responses to comments, which were published after the Assessment Plan. The comment appears to state that EPA requires further evaluation of COPECs that may have been released at the Site, even if the existing data do not show concentrations substantially higher than background. This would suggest that EPA recognizes that existing data may not adequately characterize the potential releases of these hazardous substances. The Trustees acknowledge that there are other potential sources of hazardous substances, including dioxins and furans, to the Clark Fork River. However, existing data are not sufficient to conclude that this Site did not in the past and does not currently release hazardous substances to the River. The concept of "background" also needs to be carefully evaluated to ensure that background locations are appropriately identified and that releases from the Site did not impact areas that are being identified as background.

- *Comment 24 (p. 7): The findings of the source and pathway analyses are at odds with EPA's conclusions from the draft risk assessments, concluding that concentrations of relevant chemicals of concern at the Site and in the Clark Fork River are similar to those upstream of the Site and exposures to most chemicals appear to be natural background or anthropogenic sources unrelated to the Site. EPA stated: "Exposure to sediments and surface waters of on-Site creeks or the CFR [Clark Fork River] appear to be influenced significantly by either naturally occurring concentrations or other anthropogenic sources as evidenced by statistical tests that found concentration distributions between Site and upstream samples to be equivalent" (USEPA 2020c, p. 61).*

The Trustees have determined that existing data based on grab samples are insufficient to draw conclusions about the sources and pathways of the relevant chemicals of concern. The Trustees believe that data need to be collected using methods designed to capture hazardous substances such as coplanar PCBs and dioxins/furans before definitive conclusions can be made. The upstream sample locations also need to be evaluated further to determine that they were not impacted by the Site aerial emissions.

- *FCAs are discussed as the basis for injury, yet there is no discussion or acknowledgment of the baseline conditions. The FCA begins well upstream of the Site at the confluence of the Blackfoot River and Clark Fork River upstream of the city of Missoula.*

    - *Comment 25 (pp. 7–8): The Trustees do not discuss the baseline FCAs for the fish species they review. For example, they state that Northern Pike has a "do not eat" advisory, but fail to acknowledge that statewide there is a general advisory to "do not eat" Northern Pike over 28 inches and to eat only one meal per week for Northern Pike less than 20 inches (MFWP et al. 2021).*

In 2013, MFWP (a representative of the Montana Governor, a Trustee) determined that rainbow trout and northern pike in the vicinity of the Site had elevated concentrations of coplanar PCBs and dioxins, and they subsequently issued the FCAs based on these data. The same researchers helped to identify existing data gaps and design the proposed studies in the Assessment Plan.

The Trustees are aware that there are other potential sources of hazardous substances in the Clark Fork River, and that existing data are not sufficient to conclude whether this Site is a source of coplanar PCBs and/or dioxins found in northern pike and rainbow trout. The fact that there are FCAs for northern pike in other parts of the state does not explain why PCBs and dioxins are higher in fish collected near this Site.

2.2 Comments on "Injury Quantification"

The NRDA Plan suggests damage determination methods that are not appropriate and should not be considered further.

- *Comment 26 (p. 8): The NRDA Plan suggests that a valuation approach could be used, but does not specify that values would also be developed for restoration projects. The implied approach is to quantify injuries as a dollar loss using economic valuation methods, and then this amount would be spent on restoration. This generally leads to a biased estimate of NRDs. The value-to-cost methodology should be dropped unless a full analysis shows that service-to-service methods are not applicable, and valuation of restoration benefits is not feasible or cost-prohibitive.*

The Assessment Plan presents multiple approaches to damage determination, including service-to-service and resource-to-resource methods. Because damage assessment is sequential, the Trustees need to address the data gaps in sources, pathways, exposure, and injuries before reaching a conclusion about which method is most appropriate for determining damages.

- *Comment 27 (p. 8): The NRDA Plan states that contingent valuation can be appropriate for ecological services. The use of stated preference methods such as contingent valuation (mentioned in the NRDA Plan) has been demonstrated to be unreliable, especially when applied to non-use services of natural resources (McFadden and Train 2017). This method should be dropped from further consideration.*

Contingent valuation is a valid method of calculating damages [43 CFR § 11.83]. The Trustees are unlikely to rely on this method, but they need not preclude it. The Trustees will meet the

following criteria when choosing among the cost estimating and valuation methodologies and will document the determination in the Report of the Assessment. The selected methodologies will: (i) be feasible and reliable for a particular incident and type of damage to be measured; (ii) be performed at a reasonable cost, as that term is used in this part; (iii) avoid double counting or allow any double counting to be estimated and eliminated in the final damage calculation; and (iv) cost-effective, as that term is used in this part. 43 CFR § 11.83.

- *Comment 28 (p. 8): Exceedances of thresholds are not adequate metrics for establishing service loss in a habitat equivalency analysis (HEA). Habitats, specifically the services provided by habitats, are assessed in an HEA and individual receptor-based assessment, such as exceedances to thresholds, do not directly translate to service loss for the entire habitat and ignore all of the other services provided by the habitat (e.g., wetland habitats and services such as flood protection and water retention).*

The Trustees have used HEAs in many cases and are familiar with the method. If the Trustees select this method for damage determination, they will explain in detail what the service metric is and why it is an appropriate metric for service losses and gains.

- *Comment 29 (p. 8): The NRDA Plan suggests that a resource equivalency analysis (REA) may be used to address potential injury to groundwater. An REA assumes that all services move in proportion to the amount of the groundwater resource (e.g., volume or recharge rates or flux). This is not an appropriate assumption as groundwater services depend to a large degree on location relative to potential users (human and biological). Therefore, REA should not be used to address groundwater issues without adjustments for service provision.*

REAs have been used for groundwater on many other NRDAs. The goal is to restore groundwater to baseline groundwater quality. includes equivalent services.

The NRDA Plan concludes that a "simplified assessment" is not appropriate for the Site because levels of contamination are high. This is a premature and inappropriate conclusion.

- *Comment 30 (p. 8): The need for NRDA studies as well as their design should be assessed considering their ability to increase the accuracy of the assessment and their cost. This is specified in the NRD regulations promulgated pursuant to CERCLA. This determination cannot be made at this time; it requires an evaluation of the ability of the study to inform restoration decisions, which has not been included in the NRDA Plan.*

The "simplified assessment" refers to a Type A assessment in the NRDA regulations [43 CFR § 11.33]. For multiple reasons described in Section 1.3 of the Assessment Plan, this Site is not appropriate for a Type A assessment.

- *Comment 31 (p. 9): The CERCLA NRD regulations define an assessment cost as "reasonable" when "the anticipated...benefits in terms of the precision or accuracy of estimates obtained by using a more costly...methodology are greater than the anticipated increment of extra costs of that methodology" (43 CFR §11.14(ee)). When proposing NRDA studies, the NRDA Plan makes no*

demonstration that incremental costs (above using already-available information) are reasonable according to this definition. The required analysis would need to show that proposed studies will lead to expected improvements in restoration decisions sufficient to justify study costs.

The existing data from the Site were not collected using methods that adequately characterize the potential sources of hazardous substances, pathways to natural resources, and natural resource exposure and injuries. The Trustees have shown in the Assessment Plan that dioxin/furan concentrations increase in biological resources downstream of the Site. Kraft mills that bleached their product are a known source of dioxins/furans. Analytical methods for detecting dioxins in grab samples lack the sensitivity necessary for detecting dioxin concentrations at levels sufficient to cause environmental injury. , The assessment studies are designed to answer questions about past and ongoing releases of dioxins/furans from this Site, as well as potential biomagnification in high, trophic-level species. The existing data do not allow the Trustees to adequately determine and quantify natural resource and service injuries. Therefore, additional data collection is required to conduct the injury assessment.

- *Comment 32 (p. 9): The Trustees cannot make fair and informed decisions about the need for and design of potential NRDA studies without an assessment of the efficacy of existing and planned information (such as the BERA and other RI studies) for determining service losses, and without a preliminary estimate of the costs of potential restoration actions to address service loss.*

The Trustees recognize that 43 CFR § 11.38 provides, "Where possible, the authorized official should make the preliminary estimate of damages before the completion of the Assessment Plan as provided for in §11.31 of this part. If there is not sufficient existing data to make the preliminary estimate of damages at the same time as the assessment planning phase, this analysis may be completed later, at the end of the Injury Determination phase of the assessment, at the time of the Assessment Plan review." The Trustees have reviewed and presented existing data from the BERA and other RI studies in the Assessment Plan. The existing data are not sufficient for a preliminary estimate of damages nor an injury assessment. The Trustees cannot make informed decisions about the injury assessment, service losses, or the cost of restoration to address service losses without first addressing the identified data gaps. This analysis of the preliminary estimate of damages will be completed by the end of the injury determination phase, if not sooner.

2.3 Comments on Proposed Data Collection

The NRDA Plan proposes several additional data collection efforts that are unsupported.

- *Comment 33 (p. 9): It is impossible to understand the value of additional data collection without a full assessment of data collected to date at the Site. Additionally, the RI data set has been deemed complete by EPA for the purpose of nature and extent and risk assessment.*
    - *EPA reports in the final BERA response to comments that sufficient data have been collected to evaluate any potential risks to human health or the ecosystem from the Site. EPA did not require or recommend additional*

sampling to address uncertainty discussed in the risk assessments (USEPA 2021d).

See response to Comment 10. The goals of the RI and the BERA are different than the goals of NRDA. The Trustees have a responsibility to assess whether or not releases of hazardous substances have occurred at concentrations sufficient to cause injuries. The Trustees do not agree with the conclusion that no additional data are necessary.

- *Comment 34 (p. 9): Additional data collection within the Clark Fork River for surface water or sediments is not warranted for evaluating impairment.*

The Trustees must evaluate both past and current releases and injuries. Dioxin/furan and coplanar PCB concentrations are higher in organisms downstream of this Site, and kraft pulp mills that bleached are known sources of dioxins. The Trustees have a responsibility to assess whether or not releases of hazardous substances have occurred at concentrations sufficient to cause injuries.

- *Comment 35 (p. 9): The NRDA Plan proposes additional data collection without fully defining metrics for evaluating service losses/gains and furthermore does not and cannot perform a proper data gaps assessment from which to develop additional sampling plans for those metrics.*
    - *Additional data collection at this phase is premature given injury assessment metrics have yet to be defined. It is impossible to know that the Site data collected to date are insufficient for injury assessment without first understanding the metrics and furthermore the relationship of those metrics to services.*

See response to Comment 4.

- *Comment 36 (pp. 9–10): Collection of additional data to support source and pathway analyses is premature given that this NRDA Plan has been developed prior to completion of the RI report. Data have been collected and analyzed for the RI, but in some cases have not yet been reported. For example, the Plan states: "While the data from the fish tissue studies confirm exposure of downstream biological resources to elevated dioxins/furans and coplanar PCBs, they may not be sufficient to determine the source of these contaminants. Trustees propose addressing some of these potential data gaps." Detection of PCBs does not confirm exposure is Site-related (Integral 2021). It is also unclear how additional sampling downstream of the Site will address source of COPCs and resolve these data gaps.*

The Assessment Plan notes that fish downstream of the Site have been exposed to these hazardous substances. It does not state that the Site is the source. Additional data are needed before a source can be confirmed.

The Trustees regularly evaluate new data uploaded to the Scribe database. In the unlikely event that previously unreported data address the data gaps that the Trustees have identified, the Trustees would change their sampling plans.

- *Comment 37 (p. 10): It is not possible to understand the value of additional data collection without also understanding potential restoration opportunities and costs. The need for potential data collection to refine injury determination may be completely offset by identifying effective and efficient restoration opportunities.*

This comment assumes that the Trustees can scale restoration opportunities without knowing the extent of injuries. To identify and scale restoration opportunities without collecting additional data, the Trustees would need to assume that the Site is a source of dioxins/furans in the Clark Fork River.

- *Comment 38 (p. 10): The NRDA Plan for collecting additional data will not achieve the stated objectives.*
  - *For instance, additional fish tissue data collection as described would not achieve the stated goal of identifying fish contaminant sources.*
  - *As previously discussed, fish tissue data are inappropriate for forensic analysis due to differences in congener uptake and depuration rates, as well as confounding factors such as species, age, size of fish, and home range.*
  - *The identification of NRD injury has not established potential migration pathways from the Site to natural resources that would result in an observed injury.*
  - *The rationale for collection of depositional sediment data is unsupported. It would be inappropriate to use sediment depositional data in non-depositional areas as representative of potential exposure for the purpose of injury quantification, particularly in an HEA framework. Furthermore, the decision to collect sediment cores is based on fish tissue data, which as previously discussed are a poor indicator of localized concentrations. It is unclear how depositional sediment data will be used in the injury quantification.*

The first three bullets were noted and addressed in previous comments. The final bullet regarding sediment core data addresses hypotheticals that are not in the Assessment Plan. The Trustees did not design this study because of fish tissue data, and they do not intend to use the data in a HEA model with a spatial interpolation into non-depositional areas.

- *Comment 39 (p. 10): The proposed sampling does not consider the following:*
  - *The proposed fish sampling locations do not account for potential sources to the Clark Fork River downgradient from the Site, for example, the Flathead River, which joins with the Clark Fork River between two proposed sample locations.*
  - *The NRDA Plan includes no consideration of ecological characteristics of selected species. Fish home range, population dynamics, and other*

features can have significant impacts on reliability of using fish tissue as an indicator of a specific area's concentration.

The Trustees are aware of the Flathead River confluence, fish home ranges, and other variables that will need to be addressed as part of the injury assessment, if the additional data show that fish downstream of the Site are exposed to elevated levels of PCBs and dioxins/furans.

- *Comment 40 (pp. 10–11): The proposal for collecting additional groundwater data is not supported.*
    - *Previous groundwater and Clark Fork River investigations have sufficiently evaluated the potential extent of COPCs present in groundwater discharge to the Clark Fork River.*
    - *Extensive monitoring results show that dioxins, arsenic, manganese, and iron are the primary COPCs in shallow groundwater. PCBs, VOCs, SVOCs, and other metals are not present in shallow groundwater onsite at concentrations above risk-based standards or background levels (NewFields 2021b; USEPA 2020a,b,c). Despite the presence of certain COPCs in shallow groundwater, only manganese has been observed in the Clark Fork River at concentrations above an SMCL, which is an aesthetic guideline.*

See response to Comment 10.

There is no evidence for potential injury to groundwater (as a resource) or Osprey at the Site; therefore, further investigations for the purposes of injury assessment are unsupported.

- *Comment 41 (p. 11): Extractive services of downgradient groundwater do not appear to be impaired. Ecological services of groundwater are included in other sections of the NRDA Plan. Groundwater as a resource should be dropped from the assessment.*
    - *Groundwater services include extractive services when groundwater is used for irrigation, industrial, or other uses now or in the future, and ecological services when groundwater services as a pathway by which contaminants reach other receptors.*
    - *The Trustees are addressing potential loss of ecological services of groundwater based on evaluations of habitats, biota, and human use. Therefore, a separate groundwater assessment would be duplicative.*
    - *The NRDA Plan states that a method such as an REA could be used to conduct an additional assessment for groundwater. This could lead to a double recovery of damages associated with ecological services.*
    - *There is no evidence of potential loss of extractive uses of groundwater at the Site.*

As noted in the response to Comment 10, existing data show that concentrations of dioxins in groundwater have exceeded state water quality standards. This is evidence of injury.

The goals of groundwater sampling using passive samplers are both to establish whether groundwater is a transport pathway linking dioxins on the Site to the Clark Fork River, and to determine whether groundwater as a standalone resource has been injured. Groundwater services are not exclusively extractive use and also include ecological services from upwelling. The Trustees have a responsibility to determine whether the groundwater as a separate natural resource has been injured.

The Trustees disagree that a groundwater REA would lead to double recovery. Groundwater that is still underground typically does not provide ecological services. In NRDA, groundwater injuries and damages are frequently calculated separately from and in addition to injuries and damages to aboveground resources.

- *Comment 42 (p. 11): There is no evidence that Osprey or similar passerine species are a potentially injured resource at the Site. Proposed collection of Osprey eggs has no basis and is unwarranted.*
    - *EPA's final BERA (USEPA 2021b) concluded no risks to Osprey or Kingfishers from any COPEC using conservative dietary exposure modeling assumptions and data collected in sediment, surface water, and rainbow trout compared with conservative literature-based toxicity data at the lowest-observed-adverse-effect-level.*
    - *The only COPEC to even exceed the no-observed-adverse-effect-level toxicity values for piscivores were mercury and methylmercury (hazard quotients of 1.9 and 1.5 respectively), which are known to have significant sources in the Clark Fork River upstream of the Site.*
    - *Previous Osprey egg research cited in the NRDA Plan did not find evidence for injury from measured (elevated) concentrations of polychlorinated compounds (Elliot et al. 2001).*

The risk-based Osprey model from the BERA would have benefited from ground-truthing using actual data. The Trustees have a responsibility to the public to evaluate potential injuries to high trophic-level species such as Osprey. Because researchers in Missoula are already monitoring Osprey along the Clark Fork River, these data can be collected cost-effectively. Therefore, the Trustees will aim to determine injuries based on data rather than models.

References

Integral Consulting. 2021. Potential Sources of PCBs in Clark Fork River Fish. Smurfit-Stone/Frenchtown Mill Site Remedial Investigation/Feasibility Study, Report for PCB Source Evaluation. Prepared for WestRock CP, LLC and International Paper Company. June.

Integral Consulting and NewFields. 2021. Natural Resource Damage Assessment Plan Review. Letter addressed to the Montana Natural Resource Damage Program. November 24.

NewFields. 2020. Groundwater Conceptual Site Model, Former Smurfit-Stone/Frenchtown Mill Site, Missoula County, Montana. Draft Version 3. June.

URS. 2012. Analytical Results Report for a Combined Site Inspection and Removal Assessment. Smurfit-Stone Mill, near Missoula, Missoula County, Montana. TDD Nos. 1105-09 and 1109-07. URS Operating Services, Inc., Denver, CO. August 20.

U.S. EPA. 1990. USEPA/Paper Industry Cooperative Dioxin Study: The 104 Mill Study. Summary Report. U.S. Environmental Protection Agency. July.

Appendix A - List of Comments

No.	Individual/Association	City/Area
1	Mark Sommer	Missoula County
2	Scott Charlie	Missoula County
3	Missoula City-County Health Department – Water Quality Advisory Council	Missoula, MT
4	Missoula Conservation District	Missoula, MT
5	Westslope Chapter Trout Unlimited	Missoula, MT
6	Montana Trout Unlimited	Missoula, MT
7	Robin Carey	Missoula, MT
8	Tim Berry	Missoula, MT
9	Ted Mead	
10	John Snively	Missoula, MT
11	John Lundt	
12	Danita Schoen	
13	Brent Dodge	Missoula, MT
14	Charlie Burk	Missoula, MT
15	Bitterroot Trout Unlimited	Hamilton, MT
16	Chris Spiker	Missoula, MT
17	Dennis and Kathy Terrazone	St. Regis, MT
18	Jeff Heffernan	Missoula, MT
19	Kathy Heffernan	Missoula, MT
20	Gary Fee	Alberton, MT

21	John A. Harris MD	
22	Josh McKown	Philipsburg, MT
23	Frenchtown Smurfit CAG	Frenchtown, MT
24	Todd Skibbe	Alberton, MT
25	Penny Ritchie	Florence, MT
26	Elmer W. Palmer	Lolo, MT
27	Clark Fork Coalition	Missoula, MT
28	Roger Furlong	Missoula, MT
29	Integral Consulting	Missoula, MT
29A	Integral-Potential Sources of PCBs in Clark Fork River Fish Report	Missoula, MT
29B	New Fields Technical Report	Missoula, MT
30	Hellgate Hunters and Anglers	Missoula, MT
31	Vicki Watson	Missoula, MT
32	Montana Trout Unlimited signatures	Missoula,. MT
33	Missoula County Commissioners	Missoula, MT
34	John Beighle	Deer Lodge, MT
35	Eli Molloy	
36	Dennis Terrazone	

Appendix B – Individual Comments

Flugge, Meranda

From: msommer@apleco.com
Sent: Wednesday, October 6, 2021 10:15 AM
To: Natural Resource Damage Program
Subject: [EXTERNAL] Smurfit Assessment Plan Comments
Attachments: Unnamed Stream Aerial.jpg; Unnamed Stream Topo.jpg; Unnamed Stream.zip

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

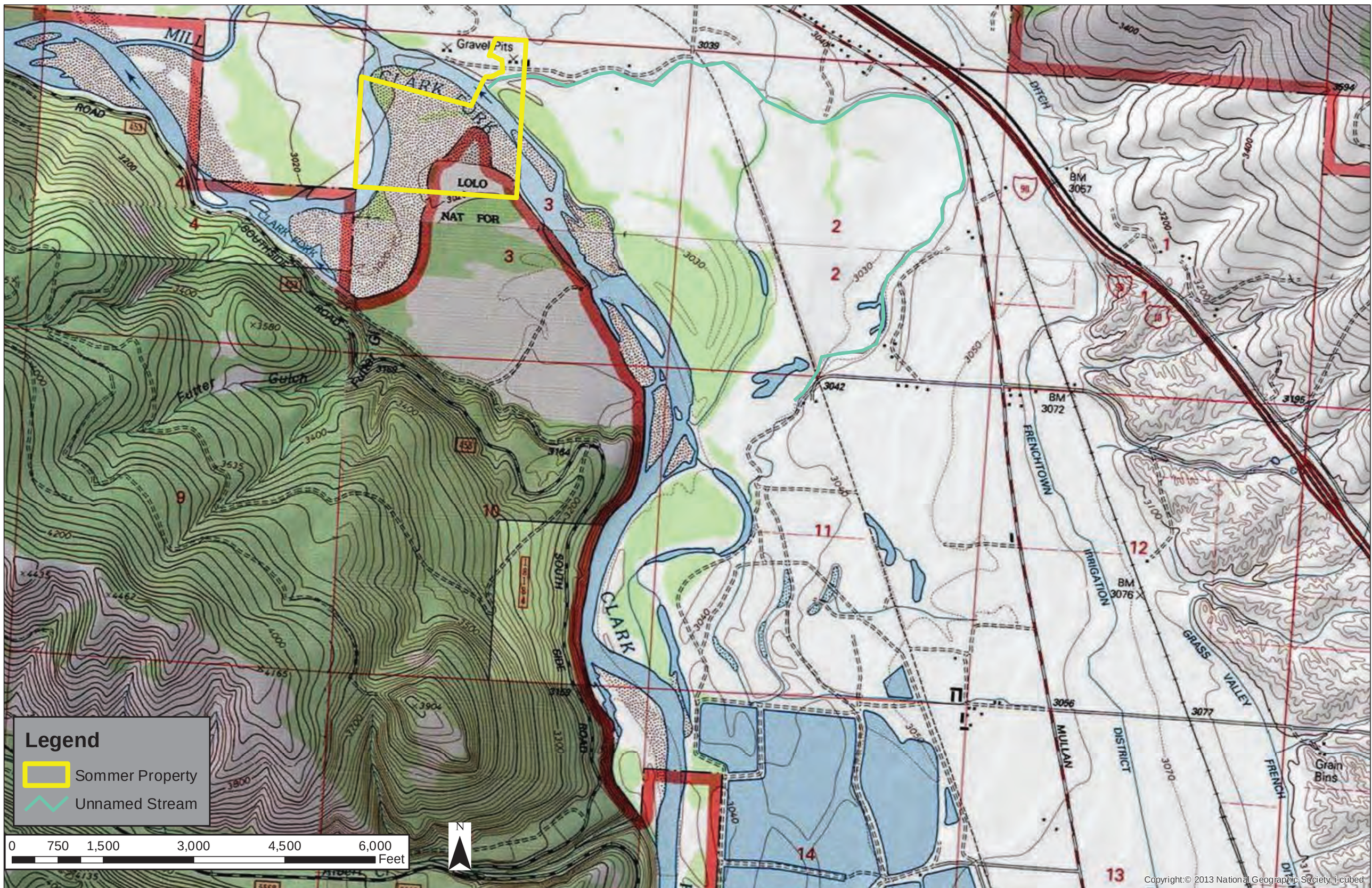
Hi,
I am providing comments on the Smurfit Assessment Plan.

I own land on both sides of the Clark Fork River a few miles downstream of the millsite. An unnamed perennial stream passes through my property which is a tributary to the Clark Fork River and its mouth is on my property as well. While I have never walked the stream from its mouth upstream to its source, I believe its source may be the millsite. See the attached maps.

In my opinion, this unnamed stream should be considered in the assessment. I am not exactly sure what "considered" means, but I guess as a starting point it should be determined whether or not the source of this stream is from lands on the millsite. If so, it would seem pretty important to look at the stream in more detail. Maybe it means taking surface water samples. Maybe it means taking sediment samples. Maybe it means taking fish samples, as during the spring fish, especially northern pike, inhabit the stream. Lots of waterfowl use it as well. Maybe it means looking at the types of uses that the public is making of the stream.

I have attached a shapefile of the stream to share with your consultant. It is somewhat rudimentary as I just hand-drew it off the aerial photo, but it provides a good starting point.

If you have any questions or want to discuss you can reach me by email or my phone number which is 406-360-4414.
Thanks,
Mark Sommer



Legend

- Sommer Property
- Unnamed Stream

0 750 1,500 3,000 4,500 6,000 Feet

N

Comment 2

RECEIVED
NOV 01 2021
NATURAL RESOURCE DAMAGE PROGRAM

10/27/2021

Natural Resource Damage Program

Subject line: Smurfit Assessment Plan Comments

My name is Anthony Scott Charlie. People know me as Scott Charlie but you can call me Charlie, and I'm commenting about the Plan I have for the old Pulp Mill out in French Town.

Plan: Is to Build Life Cargo Carts out there which will be designed and perfected on the Rail Road Tracks between Missoula's Broadway and Milton and Sherwood st. Then Manifactured at the Pulp mill sight because the infrastructure Rebuild would be minimum; only at the Sight not all thru the landscape. And I believe it could potentially be Import and Export type business for Missoula and Montana.

Life Cargo Carts are what the name says "Life Cargo Carts" as in Aquaponic Stations to try to make Cities Across America Self Sustaining, by using the Working Formula of One Master of 3, 6ix, 9ine. (1) being the Consumption Factor of all Life's movement or transition from one type of energy to the next. (3) being the: Electricity, Air, Water. The 6ix being the Concept of Gardening Technique called 3 Sisters. 9ine then being a spin off of 3 Sisters being Insect, Fish and Bird.

Life Cargo Cards stem From a Project called Garden City Tracks which then go hand in hand with a Project called Missoulas 300. Project Missoulas 300 is Designed to develope Missoulas Valleys Collective Creativity Conscious to help create the Technology in Model schematics and in material and computer Tech realms via applying Population Control on the Valley of 300,000 people allowed in the Valley at any given moment. Enabling the Collective mind to imagine building Celestrial Citys which then Earns the Rich name for Missoula of "Space Colony Research City Center"

Hmm... I am Homeland Security working on a Project called Montanas Pilot Space Program which I am working on to get integrated into the Static Fusion System so please don't get distracted by my appearance of my Field Research status Keep your ears open I request of you because I am in calculated movement as I address the issues slowing progress.

To continue with the Plan and my sharing my comments with you We are now Consciously entering the Space Age again. Space X has really made this Entering Space Age Era noticeable in Elon Musks campaigns for Money to continue his Path Finding, but. We can now imagine Space Colonization with out being thought of as weird scifi Nerds. So, in that new found liberty of thought we need to Realize that we are in a Space Race against other Countries to touch and claim other Rocks out in space in our solar system. So it is our Duty as Americans to help where we can. As Montanans we have a 406 Promise to our Country and World "I got your 6 o'clock" Today and many Generations as we think as 1 made of Many

406

We Are

Chief

Oh my bad, I got excited a little bit about my status of being a Jewel on the Crown of the Continet or a Bead threadedly connected to you collectively in Chief Montana's War Bonnet Like Jewels we are you and me because we are the Sleeping Giant that is Chief Montana the Crown of the Continet. So, I employ you to find courage in the clearity, Brightness, color, and out of your mind and Sue Mesh so you can dare with me to imagine the Future Space Colonies of the Globalized Solar System which will have connecting Rail Road systems enabling development of infrastructure and Economies of Moons or Planets.

We develope the Life Cargo Carts that perfects the Working Formula that also makes "Unit Size" Measurments enabling progress or capabilities for Data and prediction of Developing Populations of Space Colonies. These Unit Sizes will be able to help compute the Complexity of building Celestrial Cities of real Populations. So, as we use the Community and the U of M student Body to build the Life Cargo Carts Design we then can use the Pulp Mill to build a Vaccum Simulaters so we can perfect the life Cargo Carts for an Anosphere Moons and Planets. Using the Toxicisty of the Pulp Mill to encourage the th Thinking of the No Anosphere. Employing the Imagination collectively of any External Entities or outside one looking in.

I believe Bonnets Mill could also be employed in this process of Building and exporting these Life Cargo Carts to Cities all thru The Americas which will help our Rail Road Companies get into the Space Race, because it will be their Companies or Our States own Space Force Rail Links that Evolve into the Globalized Solar System. This is what Pulp Mill is doing.

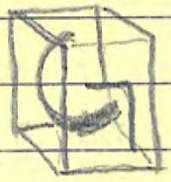
I ask you one last Question what is your agenda; To watch the World and Solar System Pass you by or to be apart of the infrastructure

building Process that ensures the Future? Cause here in Missoula we see the 406 Promise as the Only promise worth keeping. Celestial City builders and Colonialism Tag Teaming this Bitch of a World into pro creation of Brain Children called Successful Space Colonies Hence the Concept of a Globalized Solar System.

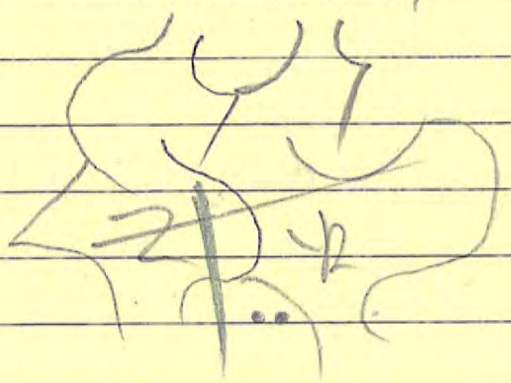
Thank you for your time and for as I'm concerned you are already Employed in Chief Montana's Mission to Keep the 406 Promise. So, do what i need to be done on your front and I'll keep it up on my front line and we will Do like Chief and lead from the Front to gain the Ground of our Solar System. Put Music of your emotion to that line because it's our Vibe Victory Dancing our Song and Dance is Sleeping Giant Woke because our Brothers and sisters have Spoke

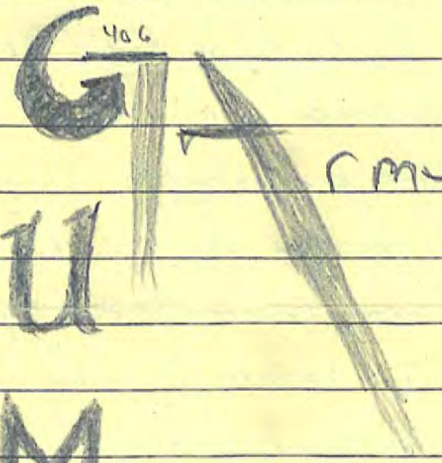
Welcome to GTerry

Encoded by Art, the Divine language, Spoken to us, then us, and for us....



you GTerry when you Down GTump... Staying Down to Come up. Gaining Ground in our Solar System





P.S.

Tell Mr. G I said what's up.

Greg Gianforte.

Comment 3

Missoula City-County Health Department
Water Quality Advisory Council
301 W Alder | Missoula MT 59802-4123
www.missoulacounty.us/wqac
Phone | 406.258.4890
Fax | 406.258.4781

November 10, 2021

Received by NRDP
11/10/2021 9:54AM

Attn: Mr. Brian Bartkowiak
Montana Natural Resource Damage Program
PO Box 201425
Helena, MT 59620-1425

RE: Natural Resource Damage Program Assessment Plan

Dear Mr. Bartkowiak,

The Water Quality Advisory Council (WQAC) supports the proposed Natural Resource Damage Program (NRDP) Assessment Plan for the Smurfit-Stone Mill Site. The Water Quality Advisory has expressed concern over the site since its closure in 2010 and provided comment throughout the Environmental Protection Agency's risk-based process. However, we remain concerned that current site characterization minimizes site impacts and is insufficient to determine actual impacts the Clark Fork River, fisheries, and other natural resources.

EPA has so far not required the PRPs to collect additional data that WQAC has requested to help to identify contaminant pathways and resolve any connections between contaminants found at the site and impacts to natural resources. In July 2018, the WQAC requested that EPA and DEQ evaluate using high volume sampling for dioxin in surface water to address some of the deficiencies regarding detection limits in the current site and Clark Fork River data. We reiterated these points in our comment on the draft BERA. WQAC comments are attached. Neither agency has responded nor provided agency opinion regarding whether the high volume sampling method for dioxin is appropriate for the site. We understand that the passive sampling devices proposed by NRDP may provide similar low level detection limits, but wish to pass our information on the high volume method on to NRDP for consideration. It is possible they two methods are similar, as we do not have all of the details for each method.

The WQAC is also concerned that contaminant transport pathways exist between dioxin contaminated groundwater at the site and the Clark Fork River. I submitted personal comments on the draft Groundwater Conceptual Site Model (CSM) requesting that the remedial investigation further evaluate potential pathways from groundwater to the river (attached). Due to timing of the public comment period for the CSM the WQAC was unable to comment.

NRDP's assessment plan will address these data gaps. The plan identifies ways to further identify offsite contamination and to resolve potential contaminant pathways that may have existed when the mill was operating, and which may currently exist. We are especially interested in seeing if sediment sampling can be used to resolve continuous annual records of contaminant inputs both at the mill site and off site. We hope sediment contaminant records can be evaluated for any correlation between contaminant deposition and/or fingerprint of dioxin congeners at the site and in sediment at Thompson Falls Reservoir or in the Clark Fork River. We believe that such data may be the best way to resolve any connections between contaminants found at the site and impacts to natural resources off site such as the clear impacts to fisheries resulting in FWP's do not eat advisory. We recommend that the assessment plan take sufficient sediment cores to improve the chances of having cores with

identifiable annual records of sediment deposition. We also recommend sampling those cores at a scale necessary to correlate any temporal pattern of dioxin/PCB loading to sediment both at the mill site and sediment off site.

NRDP's assessment plan is an important step to improved characterization and a necessary step for community acceptance that the site is being adequately characterized. We thank NRDP for pursuing this important information.

Sincerely,

Ian Magruder, Chair

Water Quality Advisory Council

Missoula City-County Health Department
Water Quality Advisory Council
301 W Alder | Missoula MT 59802-4123
www.missoulacounty.us/wqac
Phone | 406.258.4890
Fax | 406.258.4781

July 9, 2018

Sara Sparks
EPA, Region 8, Montana Office, Federal Building
10 West 15th Street, Suite 3200
Helena, MT 59626

Keith Large
Montana Department of Environmental Quality
P.O. Box 2000901
Helena MT 59620

Dear Ms. Sparks and Mr. Large,

Subject: Dioxin testing of surface water at Smurfit

Dear Sara and Keith,

The Water Quality Advisory Council (WQAC) discussed the May 23, 2018 Water Sample Results (Dioxin/Furans) for the Former Smurfit Stone / Frenchtown Mill Site at our June 12, 2018 meeting. Our review of the laboratory results indicates that the Method Detection Limits (MDLs) and Reporting Limits (RLs) for dioxin analyses are too high to be useful in determining definitive concentrations of dioxins relative to surface water standards. We understand this is a common situation at dioxin-contaminated sites because the standard method (EPA Method 8290) commonly results in detected concentrations within a magnitude of 1 picogram per liter (pg/L) at best; whereas surface water standards are at least 200 times below the MDL. The human health standard for dioxin is very low, 0.005 pg/L, owing to it's incredibly high bioaccumulation and toxicity in fish tissue. The net result is that the analyses report "Non-Detect" at the higher RLs, which confuses interpretation of the sampling results. Sampling for dioxin is extremely expensive and we do not believe further sampling using the past method is likely to provide useful information about the risk to human health related to the Former Smurfit Stone / Frenchtown Mill Site or Clark Fork River water quality.

An innovative dioxin sampling method is able to detect the presence of dioxin in surface water at much lower concentrations. The Ohio River Valley Water Sanitation Commission (ORSANCO) uses a high-volume water sampling method to obtain detection limits and reporting limits 1000 times lower than the sampling method currently being used at Smurfit, with an MDL below 0.001 pg/L for dioxin. With this MDL, dioxin concentrations within the Montana DEQ-7 human health surface water standard of 0.005 pg/L can be identified.

I spoke with Sam Dinkins, Technical Programs Manager at ORSANCO and discussed the high-volume water sampling method they use for dioxin analysis. He indicated that this method has been useful for characterization of ambient dioxin concentrations in the Ohio River. The WQAC believes that using the high-volume water sampling method may help to resolve lingering questions about ambient dioxin impacts to the Clark Fork River and in doing so, determine if these impacts are associated with the Former Smurfit Stone / Frenchtown Mill Site.

Given the expense of sampling dioxin, we believe it would be more worthwhile to collect fewer samples and obtain meaningful results rather than maintaining the current sampling plan, which does not add value to site characterization or help determine the source of dioxins.

Regards,

Ian Magruder
Chair, Missoula City-County Water Quality Advisory Council

Missoula City-County Health Department
Water Quality Advisory Council
301 W Alder | Missoula MT 59802-4123
www.missoulacounty.us/wqac
Phone | 406.258.4890
Fax | 406.258.4781

February 18, 2021

Allie Archer, Remedial Project Manager
EPA, Region 8, Montana Office, Federal Building
10 West 15th Street
Helena, MT 59626

Keith Large
Montana Department of Environmental Quality
P.O. Box 20000901
Helena, MT 59620

Dear Ms. Archer and Mr. Large,

The Water Quality Advisory Council submits these comments concerning the November 2020 Draft Baseline Ecological Risk Assessment for Operable Units 2 and 3 (BERA) and the December 2020 Draft Human Health Risk Assessment (HHRA) of the Smurfit-Stone/Frenchtown Mill Site Located in Missoula County, Montana.

Overall, the issues expressed in a letter submitted by the Water Quality Advisory Council in 2018 still apply to the November 2020 Draft Baseline Ecological Risk Assessment and the December 2020 Draft Human Health Risk Assessment. In particular:

1. The data upon which the risk assessment has been made are insufficient. Problems include:

    a. too few samples to adequately characterize risks on and beyond the site and no recent samples in important areas such as the 140 acres of sludge ponds.

    b. combining samples together, which has the effect of losing important detail associated with the site given that contamination is not evenly distributed.

    c. need for additional dioxin testing of groundwater and surface water of the Clark Fork using high-volume sampling for dioxin-like PCBs that have detection limits above the risk-based levels. The lack of site and river sampling is hiding the potential connection of the site to the river, which limits the geographical extent of the "facility." CERCLA's definition of a facility is "any site or area where a hazardous substance has been deposited, stored, disposed of, placed, or otherwise come to be located," so this type of testing is important for defining the facility site boundary to inform site remediation.*

2. The assessment fails to include the scope of risks known to have the potential to affect the site and surrounding environment. Examples include risks associated with channel avulsion and berm failure.

The risk characterization in the documents we comment on here represent a gross under-sampling of the area and (given how data were combined) do not sufficiently identify hot spots or the extent of contamination (facility boundary). Consequently, the assessment very likely represents a lower level of risks than what actually exist. Further, the document completely omits potential known risks such as

channel avulsion and berm failure. We believe that understanding of the site is therefore still subject to an unacceptably high level of uncertainty.

Population growth trends in Missoula County indicate that this prime area of land will be subjected to development pressure in the future. Such development is a question of when, not if. Future development of the site dictates that the cleanup must be done right. This is not a problem that we can effectively bury under a layer of clean fill, pretending that it has gone away.

The failure to adequately identify risks has the potential to affect the implementation and outcome of the entire Superfund process. Again, this needs to be done right now so that Missoula County and our watershed neighbors can be assured that the plans for remediation that are developed and implemented will adequately address the contamination associated with the site and lead to a solution that will protect the Clark Fork River, groundwater, land and soils, and plants and animals (including humans) living in and visiting this area, with some people depending on this area for subsistence.

More details concerning what needs to be done to get this risk assessment right are provided by our colleagues from the Missoula Water Quality District, the Clark Fork Coalition, and the Frenchtown Smurfit Stone Community Advisory Group. We refer to the comments submitted by these groups to support the Missoula Water Quality Advisory Council's assertion that the risk assessment to date is insufficient, and that further work needs to be done to assure that the risk characterization is adequate to support a robust cleanup of the area.

Sincerely; Water Quality Advisory Council

Dated: February 18, 2021 – Signed: Ken Crisp – *Ken Crisp* **/ Vice-Chair of WQAC**

*For reference, we include text from WQAC letter sent to Sara Sparks and Keith Large on July 9, 2018: The Water Quality Advisory Council (WQAC) discussed the May 23, 2018 Water Sample Results (Dioxin/Furans) Former Smurfit Stone / Frenchtown Mill Site at our June meeting. It was clear from looking at the results that the detection limits and reporting limits of the analytical method are not useful for resolving concentrations of dioxin near surface water standards. We understand this is a common situation at dioxin contaminated sites in the nation, because the standard method (EPA 8290) commonly results in detection limits of 1 pg/L at best, whereas surface water standards are 200 times or more below this detectable concentration. The human health standard for dioxin is very low, 0.005 pg/L, owing to its incredible high bioaccumulation and toxicity when accumulated in fish tissue. Dioxin is extremely expensive to sample for and we do not believe additional sampling at using the past method is likely to provide useful information about the contaminants at the Smurfit site or Clark Fork River water quality.

Newer dioxin sampling methods are able to detect the presence of dioxin in surface water at lower concentrations. The Ohio River Valley Water Sanitation Commission (ORSANCO) uses a high-volume water sampling method to obtain detection limits and reporting limits 1000 times lower than the sampling method currently being used (DL below 0.001 pg/L (parts per quadrillion, ppq) for dioxin). This actually resolves pollution at and near the level of Montana DEQ-7 human health surface water of 0.005 pg/L. I (Ian Magruder, Chair of the WQAC) have personally talked with Sam Dinkins at ORSANCO who described their use of the method. He reports it has been useful for them to characterize ambient dioxin concentrations in the Ohio River at very low levels. The WQAC believes that using this method may help to resolve lingering questions about dioxin impacts to the Clark Fork from Smurfit. Given the expense of sampling dioxin we believe it would be more worthwhile to collect fewer samples using the high-volume method which provides meaningful results, than the current sampling plan which does not add much to site characterization.

October 22, 2020

Allie Archer
EPA, Region 8, Montana Office, Federal Building
10 West 15th Street, Suite 3200
Helena, MT 59626

Keith Large
Montana Department of Environmental Quality
P.O. Box 2000901
Helena MT 59620

RE: Comment on Smurfit-Stone Mill Frenchtown Groundwater Conceptual Site Model Report

Dear Allie and Keith,

I have the following comments on the Smurfit-Stone Mill Frenchtown Groundwater Conceptual Site Model Report (CSM Report). Thanks for putting together the joint meeting this month with the WQAC and CAG; we also appreciated the PRPs sending NewFields there. It was very helpful to get a better understanding of the CSM.

Comments

1. The CSM report would benefit from providing maps of groundwater contaminant of concern concentrations is an iso-concentration contour map or with continuous colors (i.e. not categorized as presented in the report), with individual maps for the different aquifers. Contaminant concentration data has been impossible for us to understand because it has been housed in numerous reports within large tables and not presented graphically.

2. The report should describe how the maximum contaminant level water quality standards, EPA tap water residential screening level, etc. relates to the colors shown in Figures 24, 25, 26, 28 and what that shows us about the location of exceedances.

3. Explain how frequent groundwater elevation was monitored to determine Maximum Groundwater Level (Post Closure 2014-2019) and Minimum Groundwater Level (Post Closure 2014-2019) shown in the block model figures.

4. Discuss if Figures 33 and 34 show lower spatial resolution of sampling the Clark Fork within the site than up and downstream. If so, what is the rationale?

5. The potential for solid waste to leach to groundwater needs to be better outlined.

It's not clear how the leaching to groundwater pathway was evaluated. The CSM Report, Table 2 indicates this pathway may have been assessed in the "Site Investigation of Ancillary Parcels and Wastewater Treatment Facilities. Former Frenchtown Mill Site Missoula County, Montana" (NewFields, July 2014. I cannot find this document on EPA's webpage for the site under the "Publicly Available Documents (98 documents)." Either way, the leaching to groundwater pathway analysis methods and results should be summarized in the CSM Report.

The CSM Report states (pp 30), "Porewater collected in 2018 from the SWBs and settling ponds contained organic carbon and COPCs." This indicates the COPCs may be sourced from the ponds themselves, not just from redox changes in the aquifer leading to release of COPCs naturally present in the aquifer matrix.

Has the leaching to groundwater pathway been adequate characterized? The report should discuss contaminant levels in the sludge ponds, whether leach testing has been performed, and whether it has been determined if there is a risk of leaching to groundwater.

6. Potential for dioxin and PCB transport in groundwater needs to be completely characterized.

The CSM Report apparently concludes that dioxin will not be mobile in groundwater because of the high proportion of organic carbon in the aquifer from mill discharge historically loading the aquifer. The CSM Report states (pp 30), "The degree of migration or retardation for dioxins and furans in groundwater is highly dependent on the fraction of organic carbon (foc) in the aquifer (EPA et al., 1990; Floyd Snider, 2015). The higher the foc, the more availability for adsorption. Therefore, at this Site where waste solids are highly organic and groundwater has a high foc, the movement of dioxins and furans in groundwater is limited."

Dioxin and PCBs may have a high affinity for adsorption to organic carbon in the aquifer matrix but that does not rule out other conditions in the groundwater at Smurfit which may be conducive to dioxin transport in groundwater. EPA's Superfund Ground Water Issue, Facilitated Transport (EPA/540/4-89/003 August 1989) states, "Many hydrophobic organic contaminants, generally considered to be highly retarded due to strong interactions with immobile aquifer material, have a high affinity for the mobile colloidal material." And, "Consequently, the potential effects of facilitated transport is likely to be greater in waste disposal areas." The issue describes dioxins and PCBs as having a high affinity for particles which are mobile in groundwater.

Surfactant facilitated transport of dioxins has also been described (Grant et al. 2011). Surfactants may be used in treating bleached softwood kraft pulp fiber (Ehara et al. 2000). APPENDIX D of the CSM Report indicates that surfactants were present in the discharge.

The CSM should evaluate if there is potential for release of the persistent organic pollutant COPCs from the waste residuals and aquifer matrix where they are adsorbed. Even if the area of the aquifer affected is small, remediation or institutional controls would be necessary to protect public health and the environment.

References:

Grant, S., Mortimer, M., Stevenson, G., Malcolm, D., and Gaus, C. (2011) Facilitated Transport of Dioxins in Soil Following Unintentional Release of Pesticide-Surfactant Formulations. Environmental Science & Technology 2011 45 (2), 406-411

Ehara, K., Tsutsumi, Y., and Nishida, T. (2000). Role of Tween 80 in biobleaching of unbleached hardwood kraft pulp with manganese peroxidase, J. Wood Sci. 46(2), 137-142.

7. The CSM Report should identify the ponds which are commonly referred to as "sludge ponds." EPA-START Analytical Results Report for a Combined Site Inspection and Removal Assessment. Smurfit-Stone Mill (USEPA and URS Operating Services 2012) refers to four sludge ponds. The public refers to these ponds as "sludge ponds" and the public should be able to understand what ponds are being described in the CSM Report. EPA and URS (2012) refer to ponds 3,4,5, and 17 as sludge ponds. Tooke (2006) shows analytical chemistry for sludge solids from ponds 5,8, and 17. Ponds with sludge in them should be

identified as sludge ponds in the CSM Report so that the public can follow the analysis of potential risks of that material.

8. The CSM Report indicates that detectable concentrations of COPCs were not detected from 2015 and 2018 grab samples from the Clark Fork River. Newfields indicated in their presentation at the October WQAC meeting that contaminant attenuation occurs within a short distance between monitoring wells located near the Clark Fork River berm and the river. The RI should investigate pore water contaminant concentrations and hyporheic sediment concentrations to confirm the hypothesized attenuation. Pore water should be sampled using sediment pore water diffusion samplers so that accurate cm-scale vertical gradients in pore water chemistry can be determined. The CSM should identify where these contaminants are attenuating and evaluate potential for contaminant release during changing chemical conditions, determine whether sediment in backwater areas is affected, and whether the attenuated contaminants will be released during flooding. The long-term fate of those contaminants should be adequately characterized.

Thanks for the opportunity to comment on this important cleanup process.

Ian Magruder
6 Columbine Rd
Missoula, MT 59802

Comment 4

MISSOULA CONSERVATION DISTRICT

November 10, 2021

Smurfit Assessment Plan Comments
Attn: Mr. Brian Bartkowiak
Montana Natural Resource Damage Program
PO Box 201425
Helena, MT 59620-1425

RE: Natural Resource Damage Program Assessment Plan

Dear Mr. Bartkowiak,

We are writing to express support for the proposed Natural Resource Damage Program Assessment Plan for the Smurfit-Stone Mill Site. The Missoula Conservation District is charged with the Montana Natural Streambed and Land Protection Act, also known as the 310 Law.

MSC 75-2-102: It is the policy of the state of Montana that its natural rivers and streams and the lands and property immediately adjacent to them within the state are to be protected and preserved to be available in their natural or existing state and to prohibit unauthorized projects and, in so doing, to keep soil erosion and sedimentation to a minimum, except as may be necessary and appropriate after due consideration of all factors involved. Further, it is the policy of this state to recognize the needs of irrigation and agricultural use of the rivers and streams of the state of Montana and to protect the use of water for any useful or beneficial purpose as guaranteed by The Constitution of the State of Montana.

The Missoula Conservation District has a history of involvement with the site through issuance of 310 stream permits for berm repair. The Missoula Conservation District has not issued repair permits to the site since its closure. Recently, the Missoula Conservation District has approached the hardening or rip-rapping of stream banks differently than when the site owners initially sought a 310 permit decades ago. This new approach toward permitting, combined with the history of repairs typically needed and lack of maintenance since 2010, indicate a need for more data to assess offsite contamination and sedimentation.

The Natural Resource Damage Program Assessment Plan will collect additional data and better characterize stream impacts. The Missoula Conservation District believes this is an important step prior to any future permitting the Missoula Conservation District would do at the site and in gaining community acceptance.

Sincerely,

Radley Watkins
Resource Conservationist

On behalf of the **Missoula Conservation District Board of Supervisors**

3550 Mullan Road, Suite 106 · Missoula, Montana 59808 · Office: (406) 303-3427

November 18, 2021

Attn: Mr. Brian Bartkowiak
Montana Natural Resource Damage Program
P.O. Box 201425
Helena, MT 59620-1425

Re: Smurfit Assessment Plan Comments

Dear Mr. Bartkowiak and Montana NRDP staff:

Thank you for considering these comments regarding Montana Natural Resource Damage Program's (NRDP) Assessment Plan for the Smurfit Site on behalf of the WestSlope Chapter of Trout Unlimited and our 750+ members. We support the NRDP plan to conduct additional environmental assessments of the Smurfit site near Frenchtown, MT, to better understand and quantify contamination of land, surface and groundwater, and to begin remediation of this site.

We are concerned about the migration of contaminated or potentially contaminated groundwater and surface water from the site, and the likely connection between that movement of contamination with impacts to the Clark Fork and lower Bitterroot native and wild trout fishery, as well as water quality. Thus, we strongly support the NRDP Assessment Plan in all regards.

The Clark Fork River is Montana's largest watershed, the headwaters of the Columbia and a vital part of the western Montana recreation economy, ecosystem, and way of life. We are especially concerned about the current fish consumption advisory for the Clark Fork and lower Bitterroot rivers. Data from the Smurfit site continue to show the migration of heavy metals and other toxins into the surrounding environment and fish tissue. This problem is worsening and the presence of sensitive native species like westslope cutthroat and bull trout heightens the urgency to end this pollution.

We continue to hear extensive concern from our members and the public about the impacts and risks posed by the Smurfit site, especially in respect to the fish consumption advisory. NRDP's assessment plan is a welcome positive step forward in understanding and addressing this legitimately heightened public concern, shared by our organization. Thank you for considering our chapter's comments.

Sincerely,

Mark Kuipers, President
WestSlope Chapter of Trout Unlimited

November 17, 2021

Attn: Mr. Brian Bartkowiak
Montana Natural Resource Damage Program
P.O. Box 201425
Helena, MT 59620-1425

Re: Smurfit Assessment Plan Comments

Hello Mr. Bartkowiak and Montana NRDP staff:

Thank you for considering these comments regarding Montana Natural Resource Damage Program's (NRDP) Assessment Plan for the Smurfit Site on behalf of Montana Trout Unlimited (MTU), our organization's more than 4500 members and supporters statewide, and our mission to conserve, protect and restore Montana's coldwater fisheries and their habitats. Our comments on this plan to conduct additional environmental assessments of the Smurfit site to better understand and quantify contamination of land, surface and groundwater from this site and, hence, begin the process of recouping lost or damaged resources align with MTU's interest and investment in the Clark Fork watershed. We have been especially attuned to the migration of contaminated or potentially contaminated groundwater and surface water from the site, and the likely connection between that movement of contamination with impacts to the Clark Fork native and wild trout fishery, as well as water quality. Thus, we strongly support the NRDP Assessment Plan in all regards.

MTU appreciates the clear and thorough site description, history and potential or known sources of contamination contained in the NRDP plan. The plan is appropriate and well-written for both technical experts and the general public. We especially appreciate NRDP's description of and decision to peruse the more thorough Type B assessment of the Smurfit site that will entail, "three phases: injury determination, injury quantification, and damage determination." Given that the Clark Fork River is Montana's largest watershed, the headwaters of the Columbia and a vital part of the western Montana recreation economy, ecosystem, and way of life, it is appropriate to use the more extensive assessment available to NRDP to best understand the contamination issues at this site, their impact on the river and its resources, and the damages to those resources for which the PRPs are potentially liable. In pursuing this Type B assessment, we encourage NRDP to put ample effort into identifying true baseline conditions against which impacts from the site should be measured. Specifically, NRDP should engage Montana Fish, Wildlife & Parks, US Fish and Wildlife Services, and any available data or literature to determine deep historic conditions of the fishery and water quality.

We agree with the Preassessment Screen that has been done, the results of which have determined that: 1) the Smurfit site has released hazardous substances, 2) the site's releases have adversely affected natural resources for which NRDP may assert trusteeship, 3) those releases are in quantities that are sufficient to cause injury, 4) obtaining data for this assessment will entail reasonable costs, and 5) current response actions won't remedy impacts to the natural resources without additional action, such as NRDP can bring to bear. MTU is especially encouraged by NRDP's focus on quantifying damages that exist and will continue to exist beyond what CERCLA remediation may repair and, thus, the need to determine, fund and carry out additional restoration or mitigation

actions. We support NRDP's focus on both assessing and, ultimately, determining what additional restoration or mitigation might be warranted for ground- and surface water on the site, as well as O'Keefe and Lavalle creeks, the main Clark Fork River and other adjacent or biologically/hydrologically connected areas and resources, including fish and wildlife. As the Assessment Plan rightly highlights, that includes numerous sensitive species like westslope cutthroat trout and bull trout.

The Assessment Plan clearly identifies and explains the hazardous substances associated with the Smurfit site, the many locations where they are found or likely to be found (especially OU2 and OU3), the pathways from those locations into the broader environment, and the risks or already occurring impacts these substances are having on the ecosystem and natural resources. We appreciate that the NRDP assessment acknowledges that "the full extent of the materials buried in waste areas at the mill property is not known (pg. 3-5)," or that "site investigations of dioxin-like PCBs are limited (pg. 4-8)," among other significant data gaps related to contamination at and caused by this site. We further agree that the most significant and concerning unknowns regarding waste quantity, location, pathway, and impacts relate to PCBs (dioxin-like substances) and dioxin/furans. As the plan states, "these compounds are persistent organic pollutants that do not readily degrade in the environment and are highly toxic (pg. 3-8)." As the plan also correctly points out, these compounds readily bioaccumulate, including in fish, with detrimental impacts to individual fish, populations and, potentially, human health. Given the potential impacts to human health, fisheries, and other ecosystem resources, we encourage NRDP and all other partners evaluating the Smurfit site to continue addressing the high exceedances (above state and/or federal standards) in groundwater and/or surface water of arsenic, manganese, mercury, and zinc. Whether it is organic compounds like PCBs/dioxins or toxic metals, the site data show increasing trends in concentrations of contaminations, especially of the organics in fish tissue samples. In short, the movement of site-associated contaminants into surrounding natural resources is worsening. Thus, the need for NRDP's Assessment Plan is urgent and increasing.

In addition to supporting the validity of the information and data presenting in the NRDP plan, MTU strongly supports the plan's aim of filling data gaps through four types of additional assessment, to determine dioxin/furan and coplanar PCB releases, fate and transport, natural resource exposure, and injuries." MTU agrees that using passive sampling devices to assess ongoing releases rather than relying on previously collected data from small grab samples will provide much clearer and accurate data on the movement of these organic compounds. Similarly, we support NRDP's plan to collect sediment core samples up- and downstream of the site to better understand past and potential ongoing releases of toxins into the Clark Fork River. MTU especially favors NRDP's plan to expand fish tissue and whole body sampling to fill in our understanding of the extent and severity that site-based contamination is impacting the fishery. Finally, we also support the plan to evaluate exposure of osprey to these organic compounds, which will provide an indicator of the degree to which they are bioaccumulating into and beyond fish.

Our organization has and continues to hear extensive public concern about the impacts and risks posed by the Smurfit site, especially in respect to the fish consumption advisory. NRDP's assessment plan is a welcome positive step forward in understanding and addressing this legitimately heightened public concern, shared by our organization. Thank you for considering MTU's comments. Please contact me if you have any questions, or if our organization can be of assistance in furthering this plan: david@montanatu.org.

Sincerely,

David Brooks
Executive Director
Montana Trout Unlimited

P.O. Box 7186 • Missoula, MT 59807 • www.montanatu.org • 406.543.0054

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Monday, November 22, 2021 8:32 AM
To: Natural Resource Damage Program; Gavin, Sonia; Clement, Kassie
Subject: FW: [EXTERNAL] Smurfit

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

Please add to the Smurfit comments.

-----Original Message-----
From: Robin Carey <rbc1214@bresnan.net>
Sent: Monday, November 22, 2021 8:03 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit

Dear Mr. Bartkowiak,

Just a note here to urge prompt action on the Smurfit site on the Clark Fork river.

I have been hearing about the potential dangers to the river from this site for years now. It's time for action. The Clark Fork is a treasure and deserves our care!

Sincerely, Robin B. Carey
3525 Duncan Drive
Missoula, MT 59802

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Monday, November 22, 2021 8:34 AM
To: Natural Resource Damage Program; Clement, Kassie; Gavin, Sonia
Subject: FW: [EXTERNAL] Smurfit Site

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

Another comment.

From: Timothy Berry <timcpchange@gmail.com>
Sent: Monday, November 22, 2021 7:25 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Site

Mr. Bartkowiak,

Please give your full consideration in dealing with the old incomplete Smurfit Site restoration. The obvious fact, everyone needs clean water.

Thanks,
Tim

Timothy D. Berry, Ph.D.
Center for Positive Change, LLC
2831 Fort Missoula Road, Ste 106
Missoula, MT 59804
406- 830-3808(o)/406- 880-3090(m)/775-243-9945(f)
www.CenterForPositiveChange.com [centerforpositivechange.com]

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Monday, November 22, 2021 8:40 AM
To: Natural Resource Damage Program; Gavin, Sonia; Clement, Kassie
Subject: FW: Smurfit Stone mill site cleanup

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: meadted@gmail.com <meadted@gmail.com>
Sent: Monday, November 22, 2021 8:35 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Stone mill site cleanup

Mr. Bartkowski,

I urge you to decide to conduct the necessary study to determine the levels of water & ground pollution at the former Smurfit paper mill site. This is the only way we can determine what cleanup is needed to remove the pollution threat to the Clark Fk. River.

Sincerely,

Ted Mead

Sent from Mail [go.microsoft.com] for Windows

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Monday, November 22, 2021 8:40 AM
To: Natural Resource Damage Program; Gavin, Sonia; Clement, Kassie
Subject: FW: [EXTERNAL] Smurfit Waste Site

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: John Snively <snively@bresnan.net>
Sent: Monday, November 22, 2021 8:36 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Waste Site

Dear Mr. Bartkowiak-

Millions of dollars have been spent to clean up the upper Clark Fork over the last decade or more. It is an ongoing project of great value to our water quality and our fishery. The Smurfit-Stone site is of equal importance in its threat to our great river and beyond. It is past time to move toward a clean-up of this location.

I urge that studies proceed to assess the extent of damage to this locality and plan its restoration. Please, move forward on the assessment plan.

Sincerely,

John Snively
Missoula

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Monday, November 22, 2021 9:12 AM
To: Natural Resource Damage Program; Clement, Kassie; Gavin, Sonia; Flugge, Meranda
Subject: RE: [EXTERNAL] Responsibility!

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

-----Original Message-----
From: Bartkowiak, Brian
Sent: Monday, November 22, 2021 9:09 AM
To: Natural Resource Damage Program <nrdp@mt.gov>; Clement, Kassie <KClement@mt.gov>; Gavin, Sonia <Sonia.Gavin@mt.gov>
Subject: FW: [EXTERNAL] Responsibility!

-----Original Message-----
From: John Lundt <johninmt@centric.net>
Sent: Monday, November 22, 2021 9:08 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Responsibility!

Clean Smurfit Stone NOW!

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Monday, November 22, 2021 9:51 AM
To: Natural Resource Damage Program; Gavin, Sonia; Clement, Kassie; Flugge, Meranda
Subject: FW: [EXTERNAL] Smurfit cleanup

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: DANITA schoen <dasiam@yahoo.com>
Sent: Monday, November 22, 2021 9:49 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit cleanup

Brian, please do whatever you can to help with the Smurfit cleanup. Thank you.

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Monday, November 22, 2021 4:32 PM
To: Natural Resource Damage Program
Subject: FW: [EXTERNAL] Smurfit Assessment Plan Comment

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: Brent Dodge <brent@brentdodge.com>
Sent: Monday, November 22, 2021 10:01 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Assessment Plan Comment

Dear Mr. Bartkowiak,

I am seeking your help with the Smurfit pollution challenge. Will you please do all you can to clean Smurfit now?

Thank you for your consideration in this matter.

Sincerely,

Brent Dodge, PT
Owner, Alpine Physical Therapy
Missoula, MT
406-370-3400
brent@brentdodge.com

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Monday, November 22, 2021 4:32 PM
To: Natural Resource Damage Program
Subject: FW: [EXTERNAL] Smurfit Assessment Plan Comments

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

-----Original Message-----
From: Charlie Burk <charlieburk@gmail.com>
Sent: Monday, November 22, 2021 10:05 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Assessment Plan Comments

I'm writing in support of the proposed study to assess the damage to the Clark Fork River from the old Smurfit site.

R,
Charlie Burk
Missoula

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Monday, November 22, 2021 4:32 PM
To: Natural Resource Damage Program
Subject: FW: [EXTERNAL] Smurfit Assessment Plan Comments

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: dward451@comcast.net <dward451@comcast.net>
Sent: Monday, November 22, 2021 11:47 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Assessment Plan Comments

Dear Mr Bartkowiak

I am the president of the Bitterroot chapter of Trout Unlimited in Hamilton Montana. We are a small organization of 340 members centered in the Bitterroot Valley. Our focus is on the East and West forks of Bitterroot as well as the mainstem of the river. Our members strongly support moving forward with the assessment of the Smurfit site. We firmly believe we need a science based clean up and mitigation plan for the site. This has taken way too long to get started and needs to move forward as soon as possible.

Regards
David Ward, President
Bitterroot Trout Unlimited

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Monday, November 22, 2021 4:33 PM
To: Natural Resource Damage Program
Subject: FW: Smurfit Stone site

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: Chris Spiker <cspiker@spikercomm.com>
Sent: Monday, November 22, 2021 2:14 PM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Stone site

Mr. Bartkowiak,

I applaud your efforts to push forward in protecting the Clarkfork River from the damage leaking from the Smurfit Stone site. The EPA has already taken far too long to demand remediation.

Chris Spiker

Spiker Communications
It's not about being better, it's about being different.
p: 406.721.0785

w: spikercomm.com [spikercomm.com]

[bit.ly] [bit.ly] [bit.ly]

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Tuesday, November 23, 2021 8:23 AM
To: Natural Resource Damage Program
Subject: FW: [EXTERNAL] Smurfit Site

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

-----Original Message-----
From: terrazone <terrazone@sbcglobal.net>
Sent: Monday, November 22, 2021 5:59 PM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Site

Dear Mr. Bartkowiak:

My husband and I live on the Clark Fork river in St. Regis. My husband is out fishing on the river 4 out of 7 days. Its appalling how long the EPA has taken to determine the extent of the damage done by the Smurfit chemical leakage. That's why we absolutely support any and all programs offered to hasten the investigation so the Clark Fork can be healthy once again!

Dennis and Kathy Terrazone

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Tuesday, November 23, 2021 8:23 AM
To: Natural Resource Damage Program
Subject: FW: [EXTERNAL] Smurfit Stone Cleanup

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: John Heffernan <nrgefishnc@gmail.com>
Sent: Monday, November 22, 2021 9:31 PM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Stone Cleanup

Mr. Bartkowiak - Just want to emphasize that as a Missoula resident and advocate for the Clark Fork River that I'm worried about what the Wood Products Industry left us at Smurfit Stone. I remember it when it was Hoerner Waldorf. Please put the cleanup on fasttrack and let's keep an eye out for shortcuts. It's important. Thank You. John Heffernan

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Tuesday, November 23, 2021 8:23 AM
To: Natural Resource Damage Program
Subject: FW: [EXTERNAL] Smurfit Stone Assessment

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: Kathy H <kjohnheff@gmail.com>
Sent: Monday, November 22, 2021 10:54 PM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Stone Assessment

Dear Mr. Bartkowiak,
The health of the Clark Fork River is of great concern to me. I am a recreational paddler and a birdwatcher and the mother of 3 serious fishermen. I ask that Montana's Natural Resource Damage Program study the pollutants at the old Smurfit Stone ponds to ensure they are not reaching the river. Thank you.
Katherine Heffernan

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Tuesday, November 23, 2021 8:24 AM
To: Natural Resource Damage Program
Subject: FW: [EXTERNAL] Smurfit Assessment Plan Comments

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: gjfee@blackfoot.net <gjfee@blackfoot.net>
Sent: Tuesday, November 23, 2021 12:13 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Assessment Plan Comments

Brian Bartkowiak,

Stop delaying remediation of the Smurfit site. Support the Montana's Natural Resource Damage Program to study and quantify the problem and to determine the cost of the damage to the public's river.

Let's get this mess fixed!

Thank you,
Gary Fee
1101 Terrace View Dr.
Alberton, MT 59820

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Tuesday, November 23, 2021 9:32 AM
To: Natural Resource Damage Program
Subject: FW: [EXTERNAL] Toxic chemicals threat to Montana's people and our fish

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: John A Harris MD <oldpond01@gmail.com>
Sent: Tuesday, November 23, 2021 9:25 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Toxic chemicals threat to Montana's people and our fish

Dear Sir,
I wish to support the study proposal by the Montana Natural Resource Damage Program to quantify the problem of harmful contamination of ground water and the Clark Fork River by seepage from the Smurfit-Stone Mill Site near Frenchtown Montana. This serious problem needs rectification right away, and the EPA should attack it with vigor, not negligence.
Respectfully,
John A Harris MD

--
The sun with one eye vieweth all the world.
Shakespeare: King Henry VI
John A. Harris, MD

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Tuesday, November 23, 2021 12:23 PM
To: Natural Resource Damage Program
Subject: FW: [EXTERNAL] Support for Montana NDRA - Smurfit Site

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: Josh McKown <josh@blackfootriver.com>
Sent: Tuesday, November 23, 2021 11:45 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Support for Montana NDRA - Smurfit Site

Brian,

I support the work done by the Montana NDRP and ABT Associates on the Assessment Plan for the old Smurfit-Stone site on the Clark Fork River. I believe the Assessment Plan is, at a minimum, a sufficient enough report to justify making immediate moves to clean up the site before further injuries, or even worse, to the public and it's resources. The site has been shut down and leaching toxins into the river for over a decade! It's well past time to do this.

Best Regards,

Josh McKown
Manager
Flint Creek Outdoors
Jackalope Joe's
P: 406.859.9500
E: josh@blackfootriver.com

Attn: Mr. Brian Bartkowiak
Montana Natural Resource Damage Program
PO Box 201425
Helena, MT 59620-1425

November 21, 2021

RE: Natural Resource Damage Program Assessment Plan

Dear Mr. Bartkowiak,

The Frenchtown Smurfit-Stone Community Advisory Group (CAG) supports the Natural Resource Damage Program Assessment Plan for the former Smurfit-Stone Mill Site.
The CAG has thoughtfully and consistently raised and expressed our concerns through public comment which include:

- Is the site an ongoing source of dioxin and dioxin-like PCB's in fish tissue downstream of the site?
- Have dioxins and dioxin-like PCB's released from the site decades ago persisted in the Clark Fork River?
- Do contaminant transport pathways exist between dioxin contaminated groundwater at the site and the Clark Fork River?
- The current site characterization minimizes site impacts and is insufficient to determine actual impacts to the Clark Fork River, fisheries, and other natural resources.

Additionally, the CAG has specifically identified the following deficiencies in the Risk Assessment:

- The spatial density of samples is insufficient for such a large area.
- Highly contaminated areas can be masked by composite sampling.
- The number of fish tissue samples taken is not sufficient to make inference. However, there is evidence that dioxin concentrations increase below the mill site. Additional sampling of additional fish tissue, osprey eggs and sediment cores could help assess risks.

The CAG strongly supports expanding the determination of flooding risk at the site due to climate change and incorporating the likelihood of channel migration into this analysis. The deteriorating berms provide little long-term protection.

The NRDP have identified data gaps and a response action that will raise the quality of the site to closer to pristine conditions. The plan suggests and identifies ways to further identify off-site contamination as well as to determine and resolve potential contaminant pathways that may have existed when the mill was in operation, and which may currently exist.

NRDP's assessment plan is a vital step to improved characterization and a necessary phase for community acceptance to ensure the Site is being adequately characterized. We appreciate and thank NRDP for pursuing this important information.

On Behalf of the Frenchtown Smurfit-Stone Community Advisory Group,

Respectfully Submitted By the CAG Admin Team:

Jeri Delys, Jennifer Harrington, Bruce Sims

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Tuesday, November 23, 2021 2:56 PM
To: Natural Resource Damage Program
Subject: FW: Smurfit Assessment Plan Comments

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: Todd Skibbe <toddskibbe@hotmail.com>
Sent: Tuesday, November 23, 2021 2:48 PM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Assessment Plan Comments

Hello Brian,

My name is Todd Skibbe and I live just downstream from the Smurfit site, in Alberton, Montana. My family and I are avid river enthusiasts and are very concerned about conditions at the site.

I am writing to voice my support for the Montana's Natural Resource Damage Program proposed study to quantify the problem and to determine the cost of the damage to the public's river.

Kind regards,
Todd Skibbe
Alberton, MT

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Tuesday, November 23, 2021 4:09 PM
To: Natural Resource Damage Program
Subject: FW: [EXTERNAL] Smurfit Stone

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: Penny Ritchie <ritchie.penny@gmail.com>
Sent: Tuesday, November 23, 2021 4:06 PM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Stone

This letter is to state my strong support for the work to assess and clean up the old Smurfit Stone site. The Clark Fork is recovering from years of abuse upstream, and we can't let this lower river seepage continue.

Thank you.
Penny Ritchie
P.O. Box 70
Florence MT 59833
406-396-7300

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Wednesday, November 24, 2021 8:21 AM
To: Natural Resource Damage Program
Subject: FW: [EXTERNAL] Re: Smurfit Assessment Plan Comments

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: elmerwpalmer@gmail.com <elmerwpalmer@gmail.com>
Sent: Tuesday, November 23, 2021 11:24 PM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Cc: 'Mark Kuipers' <westslopechapter.tu@gmail.com>
Subject: [EXTERNAL] Re: Smurfit Assessment Plan Comments

> PCBs, furans and other nasty chemicals are leaching into the Clark Fork from the old Smurfit site.

We heard these words in Butte! We heard those words in Anaconda! We heard those words in Bonner.. We suffered as these words and heard the promises that thar these areas would be cleaned, Each day that 'They' took to get things started the costs grew and the area was increased and the costs grew also.

When I was a Kid, (years ago, but I still remember) my folks would not let me wade in the Clarks Fork, it was too dirty and contaminated. Delay in correcting the problems made them more expensive and harder to accomplish.

> PCBs, furans and other nasty chemicals are leaching into the Clark Fork from the old Smurfit site. Unfortunately the EPA is slow walking its response. That's why Montana's Natural Resource Damage Program is proposing a study to quantify the problem and to determine the cost of the damage to the public's river. The plan for the study is a bit technical but for those so inclined you can access it here **[westslope-trout.us1.list-manage.com]**.

The leaks have been occurring for many years. The solutions that are discussed above should have been put in place when they were discovered, not being discussed this late in the progress. It is time for us to take action, not talk and plan.

Elmer W Palmer
Elmer W Palmer
346 Cumberland St.
Lolo, Montana 59847-9604
elmerwpalmer@gmail.com
H 406-273-0077 C 406-239-3604


TROUT
UNLIMITED

CLARK FORK COALITION P.O. Box 7539, Missoula, MT 59807 ph. 406.542.0539

November 24, 2021

Smurfit Assessment Plan Comments
Attn: Mr. Brian Bartkowiak
Montana Natural Resource Damage Program
PO Box 201425
Helena, MT 59620-1425
NRDP@mt.gov

Re: Comments in Support of NRDP's Smurfit Stone/Frenchtown Mill Site Assessment Plan.

Mr. Bartkowiak,

Thank you for the opportunity to comment on the Smurfit Stone Site Assessment Plan prepared by the Montana Natural Resource Damage Program (NRDP). The Clark Fork Coalition (CFC) has been engaged with the mill since its formation in 1985, when citizens upstream and downstream from Missoula came together in their concern about ongoing discharges to the river by the paper mill. For 35 years, CFS has continued to serve as a watchdog for our local watershed and is dedicated to its protection. In that vein, we are fully committed to ensuring a comprehensive and protective cleanup so that the former mill site can return to productive use.

CFC has been an active participant in the ongoing Remedial Investigation being overseen by the EPA and Montana DEQ at the Smurfit site. As we've expressed in numerous comment letters, CFC continues to have serious concerns about the adequacy of the remedial investigation. Among other things, the CFC is concerned that data gaps and improper sampling methodologies have created an inaccurate picture of the Site's risk to the environment, including impacts to the Clark Fork River.

The Site's Trustees share those concerns and have formulated a plan to use existing and newly collected data to fill these gaps and adequately characterize injuries to public-owned water resources and wildlife. The CFC fully supports NRDP's assessment plan and believes it will bring us a better understanding of both historical and current impacts of Site contamination on the surrounding environment. In particular, the CFC would like to offer its support of the Assessment Plan's call for additional data collection through the following methods:

Passive Sampling Devices: The Trustees propose to employ Passive Sampling Devices to evaluate potential pathways for dioxins/furans and dioxin-like PCBs from waste repositories to the Clark Fork River via shallow groundwater. To date, the EPA

has relied entirely on grab samples to measure concentrations of dioxin, furans, and PCBs, despite the fact that these methods are largely meaningless when it comes to evaluating concentrations of these contaminants in surface water. Indeed, because dioxins, furans and coplanar PCBs "are highly hydrophobic and toxic at minute concentrations, a small grab sample may not be sufficient to adequately assess the fate and transport of these chemicals and achieve detection limits low enough to determine releases to and exposure in the Clark Fork River." *Assessment Plan at 6-1.* CFC strongly supports NRDP's assessment because it will provide scientifically credible data on the flow of Smurfit's most toxic substances to the Clark Fork and potentially identify preferential pathways for the movement of contaminants between groundwater and surface water.

Sediment Core Collection: The Trustees plan to collect additional sediment core samples to evaluate depositional areas downstream of the site where past releases of dioxins/furans and coplanar PCBs may have come to be located. No study of Smurfit's impacts could be considered complete without this sediment sampling, yet there is no plan to collect such data before evaluating remedial options for Site cleanup. The CFC supports this plan to more fully evaluate the extent of the Site's impact to the Clark Fork River.

Fish Tissue Collection: Based on data collected in 2013, 2018 and 2019, the State of Montana has issued a do-not-eat advisory for all species and all size classes of fish from the Clark Fork River in the greater Missoula area due to high levels of dioxin/furan and coplanar PCBs. However, as the Trustees acknowledged in the Assessment Plan, the data from the fish tissue studies confirm exposure of downstream biological resources to elevated dioxins/furans and coplanar PCBs but may not be sufficient to determine the source of these contaminants. *Assessment Plan at 4-16*. Despite the Site's history and data confirming the release of dioxins/furans and PCBs from the Site, the EPA's most recent models and risk assessments indicate that they have no plans to further investigate pathways of these contaminants or otherwise confirm (or dispel) the connection between Smurfit's legacy contamination and the Clark Fork Fishery.

NRDP's assessment calls for additional fish tissue collection to include additional sites, a broader number of species collected, and larger sample sizes to better assess the spatial extent of dioxin/furan and dioxin-like PCB exposers in the Clark Fork River. NRPD's sampling will give us a better understanding of the downstream extent of the problem and should begin to shed light on the sources of the toxins that have rendered the Clark Fork's fishery unsuitable for human consumption.

Osprey Exposure Data: NRDP's assessment plan calls for additional data collection to determine whether ospreys along the Frenchtown reach of the Clark Fork River are exposed to dioxin, furans, and dioxin-like PCBs, and to assess spatial patterns of exposure. Existing data has shown that mercury concentrations in the blood of osprey chicks at the nest near Smurfit are the highest ever recorded by the Univ. of MT in the Clark Fork watershed. CFC supports the plan's efforts accurately characterize Site impacts to the environment.

CFC believes – and the law requires – that any historical or ongoing contamination of public resources that was created by the PRPs at the Smurfit Site must be addressed by the PRPs so that the public is made whole. As such, every effort must be made to characterize the Site's impacts to human health and the environment. NRDP's proposed assessment will go a long way toward increasing the rigor and credibility of the investigation and will help the public draw meaningful conclusions about the magnitude of the problems at Smurfit and in the Clark Fork River.

Sincerely,

Karen Knudsen
Executive Director
Clark Fork Coalition
P.O. Box 7539
Missoula, MT 59807

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Wednesday, November 24, 2021 11:50 AM
To: Natural Resource Damage Program
Subject: FW: [EXTERNAL] Montana's Natural Resource Damage Program

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

From: rcfurlong1@aol.com <rcfurlong1@aol.com>
Sent: Wednesday, November 24, 2021 11:35 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Montana's Natural Resource Damage Program

Dear Mr. Bartkowiak:

I am writing to ask you to please prioritize the work needed in order to mitigate the impending disaster from the Frenchtown Pulp Mill and the accumulated toxins that they have left behind. It has become obvious that this pollution is leaching into the Clark Fork River. A situation like this should never have been allowed to occur in the first place, but since it has, it is imperative that you promote a rapid and thorough response to first study but then quickly launch the necessary mitigation efforts.

We cannot tolerate wholesale degradation of our wonderful home here in western Montana.

Please support the Natural Resource Damage Program and expedite the process moving forward.

Thank you for your attention to this matter.

Sincerely,

Roger Furlong
Missoula, MT
4062406006

November 24, 2021

Montana Natural Resource Damage Program
PO Box 201425
Helena, MT 59620-1425

Subject: **Natural Resource Damage Assessment Plan Review**
Attachments: Integral 2021, NewFields 2021a.

Dear Trustees:

The Potentially Responsible Parties (PRPs) appreciate the opportunity to review and provide comments on the Natural Resource Damage Assessment (NRDA) Plan for the Frenchtown Mill Site located in Missoula County, Montana (the Site) prepared by Abt Associates Inc. (Abt), for the Montana Natural Resource Damage Program (dated August 2021).

The NRDA Plan is premature and deficient. The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) NRDA regulations are intended to provide a procedure for determining compensation for injuries to natural resources that "have not been nor are expected to be addressed by response actions conducted pursuant to the NCP" (43 Code of Federal Regulations [CFR] § 11.10). If conducted prior to the U.S. Environmental Protection Agency's (EPA) record of decision for the Site, an NRDA cannot properly reflect the effects of any remedy. Even if there are some situations where early assessment may be warranted, the remedial investigation (RI) for the Site is not sufficiently advanced to support the NRDA. In addition, the NRDA Plan was clearly developed prior to and without reasonable consideration of EPA's final Site baseline ecological risk assessment (BERA) or baseline human health risk assessments (BHHRAs). A stated goal of the NRDA Plan is to increase efficiency by coordinating with the remedial investigation and feasibility study (RI/FS) process. Proposal of additional studies without full consideration of the RI nature and extent evaluations, or without consultation of the final risk assessment conclusions, and before a feasibility study has been performed, is contrary to this goal.

Furthermore, and not surprisingly given the premature development of the plan, the NRDA Plan is incomplete. The NRDA Plan states that studies done to address exposure and injury determination should also be useful for injury quantification and damage determination. The latter requires identification of the natural resources services that may be impaired and selection of indicators of (metrics for) those services. Without specification of services and their metrics, it is not possible for Trustees or stakeholders to determine if the proposed studies are necessary or appropriate to support decision-making regarding any restoration that may be needed. The NRDA Plan is incomplete by failing to identify the impacted natural resource services (and associated metrics) and failing to specify how the proposed analyses and studies will inform potential service loss and restoration planning.

For reasons outlined above, the NRDA Plan is premature and data collection is not warranted, but if the Trustees choose to move forward, we provide the following comments. These comments are categorized in the order they were presented in the NRDA Plan: Source Pathways, Receptors, and Baseline Conditions; Injury Quantification; and Proposed Data Collection. Please note, this letter does not include a comprehensive list of detailed comments on the NRDA Plan, but raises critical issues and provides key examples of the deficiencies of the NRDA Plan.

Technical Comments

Source Pathways, Receptors, and Baseline Conditions

The NRDA Plan contains presumptive statements about the fate and transport of contaminants, linking the Site to the Clark Fork River. Source, pathway, and receptor evaluations are underway and will be reported in the Site RI. Therefore, the presumptive statements are premature, potentially misleading and inaccurate, and additional data collection as part of an NRDA Plan is not necessary at this stage.

- The NRDA Plan is premature/unwarranted prior to completion of the RI/FS and finalization of the BERA and BHHRA.
  - As shown in the RI Workplan, 10 subsequent workplan addenda, and numerous data summary and data analysis reports (USEPA 2021a), EPA has evaluated and addressed data gaps in the RI data set and approved these data for use in the RI. These data and analyses are in progress as part of the RI report. The Trustees' presentation of the sources and pathways in the NRDA Plan are premature and should instead incorporate the RI findings.
  - As provided in 43 CFR § 11.13(e)(1), injury determination includes determining the pathway, or route, through which the hazardous substances were transported from sources to the injured resource. This assessment is currently being evaluated as part of the RI/FS process.
  - The NRDA Plan does not include consideration of the sources, pathways, and receptors presented by EPA in the final BERA or draft BHHRA nor the risk assessment conclusions. The NRDA Plan presents or proposes to perform separate, duplicative analyses, which is in opposition to NRDA regulations to avoid duplication and reduce costs as stated in in 43 CFR § 11.31(a)(3). For instance, hazardous substances, as defined by the Trustees in Table 3.1, misrepresents the current understanding of chemicals of potential concern (COPCs) at the Site. EPA's final BERA (USEPA 2021b), the previous draft BERA (USEPA 2020a), nor the draft BHHRA (USEPA 2020b,c) were consulted/cited in the creation of this table.
  - Surface water data collected show that: 1) the quality of the Clark Fork River is not degraded (as defined by State law) by the Site, and 2) the quality of the Clark Fork River

meets all beneficial uses above, adjacent, and downstream of the Site (NewFields 2021a).

  - EPA stated in the draft BHHRA: "Exposure to sediments and surface waters of on-Site creeks or the CFR [Clark Fork River] appear to be influenced significantly by either naturally occurring concentrations or other anthropogenic sources as evidenced by statistical tests that found concentration distributions between Site and upstream samples to be equivalent" (USEPA 2020c, p. 61).

- The NRDA Plan does not acknowledge all data or Site information collected to date.
  - Numerous shallow and deep monitoring wells are located downgradient of the former wastewater system and along the length of the Clark Fork River boundary (NewFields 2021a,b). Monitoring results show that dioxins, arsenic, manganese, and iron are the primary COPCs in shallow groundwater. Polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and other metals are not present in shallow groundwater onsite at concentrations above risk-based standards or background levels (NewFields 2021b; USEPA 2020a,b,c). Despite the presence of certain COPCs in shallow groundwater, only manganese has been observed in the CFR at concentrations above a secondary maximum contaminant level (SMCL). SMCLs are not enforceable and are used to provide guidance for aesthetic reasons (i.e., taste and color). Manganese has been observed elsewhere upgradient and downgradient from the mill at levels above the SMCL (NewFields 2020; Brumbaugh et al. 1994).
  - The Trustees' pathway assessment is incomplete and does not include consideration for the Site's distinctive physical features. For example, the NRDA Plan states, "In addition, hazardous substances in ponds, the industrial area, landfill areas, the land farm area, and contaminated soils may be transported to the Clark Fork River and nearby creeks by surface runoff during spring snowmelt, seasonal precipitation, and storm events." Misleading statements like this imply that surface water simply transfers COPCs into the Clark Fork River with no consideration of the impact from the Site's distinctive physical features such as berms, settling ponds, or other Site features, which collectively make overland transport an incomplete or insignificant potential pathway. Furthermore, the treated water stored in the holding ponds adjacent to the Clark Fork River met all Montana Pollution Discharge Elimination System (MPDES) criteria for discharge to the Clark Fork River during prescribed times of year (SSC 2010).

- The analyses presented in the NRDA Plan misinterpret the data and mischaracterize the Site habitat and features.
  - The Trustees' potential identified pathways (Figure 5.1 and associated text) appear to ignore and are inconsistent with the findings of the comprehensive BERA process that has already taken place, and do not match EPA's final BERAs for OU1 (USEPA 2017) or OU2 and OU3 (USEPA 2021b) (e.g., compare to Figures 2.7A and 2.7B in the OU2/3 BERA and Figure 2-4 in the OU1 BERA). As an example, the Trustees suggest

groundwater as a potential pathway while final BERAs indicate a lack of any complete groundwater pathways at the Site.

- Statements such as "The highest concentrations of both arsenic and manganese are downgradient of the primary and secondary water treatment ponds (*NewFields 2017),* suggesting that the Site wastewater stream is the source of the contamination" are misleading, given that no Site wastewater stream has been generated or discharged for more than 10 years. When used out of context, this statement grossly oversimplifies the source, transport and fate of arsenic and manganese at the Site. The source, transport, and fate of these COPCs are detailed in NewFields (2020).
- Fish tissues are not appropriate for forensic analyses because fish: 1) take up different congeners into their tissues at different rates, and 2) metabolize congeners at different rates. Rates of uptake vary among individual dioxins and furans and dioxin-like PCB congeners by both vertebrates and invertebrates. These rates are controlled to a large extent by the size of the molecule, whereby smaller, lower-chlorinated congeners are taken up more readily across gill and gut membranes that are the larger, more chlorinated congeners (Opperhuizen and Sijm 1990). Dioxins and furans and dioxin-like PCBs can also be metabolized and excreted, and this also occurs at different rates for different congeners (Hu and Bunce 1999; Nichols et al. 1998). Elimination rates of tetrachlorinated congeners are lower than those of more chlorinated congeners (e.g., Niimi 1996). Finally, dioxins and furans do not biomagnify, unlike PCBs (Naito et al. 2003; Wan et al. 2005; Broman et al. 1992). These factors taken together make fish tissue a poor medium for source valuation of dioxins and furans and other dioxin-like PCBs. Therefore, any analysis based on congener profiles in fish tissue may not match the congener profile to which they were exposed.
- The NRDA Plan improperly suggests that data for chemicals in fish tissue from the Noxon Reservoir indicate exposure from Site-related chemicals, while failing to acknowledge the uncertainties associated with interpreting congener profiles in fish tissue. As previously mentioned, fish tissue data are not appropriate for forensic analysis. The NRDA Plan additionally fails to establish a pathway from the Site to the Noxon Reservoir or to any locations in the Clark Fork River downstream of the Site. Conclusions presented in the NRDA Plan using congener profiles in fish tissues to establish a connection to the Site are not supportable.
- The NRDA Plan attempts to establish a gradient of tissue concentrations of dioxins and furans and PCBs that are higher downstream of the Site than upstream. This is not technically defensible for the following reasons:
  - First, there is no meaningful analysis presented that demonstrated concentration levels are statistically different between sample areas.
  - Second, Abt uses data on chemical concentrations in fish tissues sampled from populations of fish species with substantial home ranges. With this information, it cannot be concluded that fish with elevated tissue concentrations collected at a

given location represent solely the concentration at the collection point. The movement of fish and their integration of exposure as they migrate confound interpretations of chemical spatial gradients and undermines this method for establishing the Site as a source.

- Third, confounding factors such as differences in rates of uptake, metabolism, and depuration of chemicals by fish are not considered. Lastly, chemical bioaccumulation rates within fish are highly influenced by fish age, size, species, food web, home range, and dietary sources of contaminants. Integral Consulting Inc. (Integral) evaluated spatial patterns of PCBs in the rainbow trout tissue data generated by EPA's Team in 2018 and 2019.[1] Spatial patterns of PCBs in rainbow trout show that total PCB concentrations in both fillet and carcass tissue are higher in Missoula, Council Grove, Frenchtown, and St. Regis than in the locations upstream of Missoula (Clinton and Greenough), and in locations upstream of the confluence of the Bitterroot River and Clark Fork River (Florence). The highest concentration of PCBs in rainbow trout fillet tissue was in 2018 at Council Grove (Integral 2021). However, many of the PCB concentrations in upstream samples are above fish consumption advisory (FCA) thresholds, indicating that other sources exist and that there is no incremental effect of the Site on indicators of injury. Integral's "Potential Sources of PCBs in Clark Fork River Fish" report (Integral 2021) provides additional analyses and discussion of potential spatial trends in fish tissue PCB concentrations.

– The NRDA Plan states: "…the 2019 data generally show an increasing trend in TEQ concentrations, including higher dioxins/furans and higher dioxin-like PCBs in trout from St. Regis downstream of the Site [see Figure 4.10]." A similar statement appears on page 69: "fish tissue data suggest an increase in both dioxins/furans and coplanar PCBs downstream of the Site, near St. Regis." Discerning trends from individual congeners that have been summed based on a toxicity equivalency are fraught with interpretational challenges and are misleading. Furthermore, evaluation of fish tissue impacts by toxicity equivalence for dioxins and furans (TEQD/F) concentrations was considered in the BHHRA and hazards were found to be less than the EPA threshold of 1 for both the recreational and tribal fisher receptors. Specifically, the report indicates: "As was observed for the recreational fisher, non-cancer hazards from ingesting TEQ in fish tissues are not above USEPA guidelines (HQ ≤ 1E+00) when based only on dioxin/furan congeners" (USEPA 2020b).

– The NRDA Plan contains inaccurate and contradictory descriptions of Site pond habitats and characteristics. For example, the NRDA Plan defines surface water as "the waters of the United States, including the sediments suspended in water or lying on the bank, bed, or shoreline… This term does not include ground water or water or sediments in

[1] Integral did not evaluate spatial patterns for the Northern Pike data because of the low sample number and due to inconsistencies in sampling; thus the Northern Pike data were excluded from averaging with the rainbow trout data because of potential differences in bioaccumulation amongst species.

ponds, lakes, or reservoirs designed for waste treatment" [43 CFR § 11.14 (pp)]. The NRDA Plan further asserts: "Hundreds of acres of holding ponds in the OU3 floodplain received Site water after the point of compliance for wastewater treatment. Water and sediments in these OU3 holding ponds meet the definition of surface water resources." However, no justification is given as to why some ponds should be considered surface water while other ponds should not. In fact, the EPA screening level ecological risk assessment (SLERA) does define OU3 uplands as wastewater treatment ponds (USEPA 2017). Without clear delineation on which ponds meet the definition of wastewater treatment, these statements are misleading.

  - The Trustees refer to several Site ponds as seasonal wetlands; however, EPA has not identified any jurisdictional wetlands onsite. The BERA does state: "Ponds containing water for most or all of the year currently are occupied by early successional stage wetland plant communities, including algae, and some floating and some emergent aquatic plants. Ponds are used by a variety of ducks, geese, and other waterfowl (e.g., grebes). They may also seasonally attract wading birds and shorebirds, amphibians, and reptiles" (USEPA 2021b). However, these ponds are manmade and have generally low-quality habitats with low benthic macroinvertebrate populations and limited vegetation and, therefore, low service value.

- The NRDA Plan cites data that do not meet EPA's approved data quality objectives.
  - The Trustees acknowledge that the URS (2012) groundwater data were rejected by EPA (because the data did not meet data quality objectives as outlined in the EPA-approved quality assurance project plan [QAPP]); however, the Trustees later go on to cite findings from this report including elevated arsenic and manganese concentrations (that were discounted and excluded from the RI data set). In contrast, the Trustees do not cite the extensive RI data set that did comply with EPA data quality objectives.

The NRDA Plan does not sufficiently discuss assessment of baseline and the available data already collected within the region for interpreting baseline conditions.

- The definition of baseline is narrowly defined as non-chemical stressors. This is an incomplete definition and is not reflective of the CERCLA regulations, which include consideration of other natural and anthropogenic sources of chemicals within the region.
- EPA has identified appropriate baseline conditions for the RI; there is no discussion of these data in the NRDA Plan.
  - The NRDA Plan relies heavily upon general references documenting conditions in the region and broader Site vicinity, implying the mill is responsible for those conditions, without Site-specific evidence. However, the mill complied with emission requirements pursuant to a Title V operating permit throughout its operating history. Also, EPA made conclusions to the contrary, for example, EPA's "Smurfit Stone Mill Site Air Deposition Fact Sheet" (USEPA 2021c) states: "EPA has concluded that the potential impacts to the surrounding environment from past emission from the Mill are very low for the

following reasons:" 1) extensive sampling in 2015 along the prevailing wind pathways from the boiler stacks indicated that "No pollutants were detected at concentrations of concern to human health"; 2) permitted burning of primary sludge materials was concluded by Montana Department of Environmental Quality to not result in adverse impacts to human health (MDEQ 1995); 3) boiler emissions comply with proposed standards for dioxin emission; and 4) dioxin and furans in soils surrounding Missoula are typical of rural areas elsewhere in the U.S. and well below other urban areas.

  - Numerous sources of dioxins/furans, coplanar PCBs, and other contaminants have contributed to concentrations of these constituents in the Clark Fork River and elsewhere in the Site vicinity, which are evident in the background data set EPA compiled to support the draft BERA and BHHRA. For example, all 11 chemicals of potential ecological concern (COPECs) in sediment of the Clark Fork River were statistically similar to or less than concentrations upstream of the Site. Comparisons of creek sediments, surface (Clark Fork River and creeks) and OU2/OU3 soils also determined that Site COPEC concentrations were equal to or less than background for some constituents detected at the Site (USEPA 2020a). In EPA's final BERA (USEPA 2021b), comparison of Site samples to representative background data were removed but delayed to the RI. In the BERA response to comments (USEPA 2021d), EPA states: "Although conducting a comparison to background concentrations was included in the BERA Work Plan as part of the COPEC refinement (EPA 2018), upon further consideration of existing guidance it was determined that comparisons with background levels should not be used to remove contaminants of concern from further evaluation owing to the need to fully characterize site risks (EPA 2001). . . Comparisons of site concentrations to background concentrations should still be considered within the RI outside of the risk assessment to provide risk managers to better characterize the results presented in the risk assessment." Baseline anthropogenic conditions within the region must also be considered.

  - The findings of the source and pathway analyses are at odds with EPA's conclusions from the draft risk assessments, concluding that concentrations of relevant chemicals of concern at the Site and in the Clark Fork River are similar to those upstream of the Site and exposures to most chemicals appear to be natural background or anthropogenic sources unrelated to the Site. EPA stated: "Exposure to sediments and surface waters of on-Site creeks or the CFR [Clark Fork River] appear to be influenced significantly by either naturally occurring concentrations or other anthropogenic sources as evidenced by statistical tests that found concentration distributions between Site and upstream samples to be equivalent" (USEPA 2020c, p. 61).

- FCAs are discussed as the basis for injury, yet there is no discussion or acknowledgment of the baseline conditions. The FCA begins well upstream of the Site at the confluence of the Blackfoot River and Clark Fork River upstream of the city of Missoula.

  - The Trustees do not discuss the baseline FCAs for the fish species they review. For example, they state that Northern Pike has a "do not eat" advisory, but fail to

acknowledge that statewide there is a general advisory to "do not eat" Northern Pike over 28 inches and to eat only one meal per week for Northern Pike less than 20 inches (MFWP et al. 2021).

Injury Quantification

The NRDA Plan suggests damage determination methods that are not appropriate and should not be considered further.

- The NRDA Plan suggests that a valuation approach could be used, but does not specify that values would also be developed for restoration projects. The implied approach is to quantify injuries as a dollar loss using economic valuation methods, and then this amount would be spent on restoration. This generally leads to a biased estimate of NRDs. The value-to-cost methodology should be dropped unless a full analysis shows that service-to-service methods are not applicable, and valuation of restoration benefits is not feasible or cost-prohibitive.
- The NRDA Plan states that contingent valuation can be appropriate for ecological services. The use of stated preference methods such as contingent valuation (mentioned in the NRDA Plan) has been demonstrated to be unreliable, especially when applied to non-use services of natural resources (McFadden and Train 2017). This method should be dropped from further consideration.
- Exceedances of thresholds are not adequate metrics for establishing service loss in a habitat equivalency analysis (HEA). Habitats, specifically the services provided by habitats, are assessed in an HEA and individual receptor-based assessment, such as exceedances to thresholds, do not directly translate to service loss for the entire habitat and ignore all of the other services provided by the habitat (e.g., wetland habitats and services such as flood protection and water retention).
- The NRDA Plan suggests that a resource equivalency analysis (REA) may be used to address potential injury to groundwater. An REA assumes that all services move in proportion to the amount of the groundwater resource (e.g., volume or recharge rates or flux). This is not an appropriate assumption as groundwater services depend to a large degree on location relative to potential users (human and biological). Therefore, REA should not be used to address groundwater issues without adjustments for service provision.

The NRDA Plan concludes that a "simplified assessment" is not appropriate for the Site because levels of contamination are high. This is a premature and inappropriate conclusion.

- The need for NRDA studies as well as their design should be assessed considering their ability to increase the accuracy of the assessment and their cost. This is specified in the NRD regulations promulgated pursuant to CERCLA. This determination cannot be made at this time; it requires an evaluation of the ability of the study to inform restoration decisions, which has not been included in the NRDA Plan.

- The CERCLA NRD regulations define an assessment cost as "reasonable" when "the anticipated...benefits in terms of the precision or accuracy of estimates obtained by using a more costly...methodology are greater than the anticipated increment of extra costs of that methodology" (43 CFR §11.14(ee)). When proposing NRDA studies, the NRDA Plan makes no demonstration that incremental costs (above using already-available information) are reasonable according to this definition. The required analysis would need to show that proposed studies will lead to expected improvements in restoration decisions sufficient to justify study costs.
- The Trustees cannot make fair and informed decisions about the need for and design of potential NRDA studies without an assessment of the efficacy of existing and planned information (such as the BERA and other RI studies) for determining service losses, and without a preliminary estimate of the costs of potential restoration actions to address service loss.

Proposed Data Collection

The NRDA Plan proposes several additional data collection efforts that are unsupported.

- It is impossible to understand the value of additional data collection without a full assessment of data collected to date at the Site. Additionally, the RI data set has been deemed complete by EPA for the purpose of nature and extent and risk assessment.
  - EPA reports in the final BERA response to comments that sufficient data have been collected to evaluate any potential risks to human health or the ecosystem from the Site. EPA did not require or recommend additional sampling to address uncertainty discussed in the risk assessments (USEPA 2021d).
- Additional data collection within the Clark Fork River for surface water or sediments is not warranted for evaluating impairment.
- The NRDA Plan proposes additional data collection without fully defining metrics for evaluating service losses/gains and furthermore does not and cannot perform a proper data gaps assessment from which to develop additional sampling plans for those metrics.
  - Additional data collection at this phase is premature given injury assessment metrics have yet to be defined. It is impossible to know that the Site data collected to date are insufficient for injury assessment without first understanding the metrics and furthermore the relationship of those metrics to services.
  - Collection of additional data to support source and pathway analyses is premature given that this NRDA Plan has been developed prior to completion of the RI report. Data have been collected and analyzed for the RI, but in some cases have not yet been reported. For example, the Plan states: "While the data from the fish tissue studies confirm exposure of downstream biological resources to elevated dioxins/furans and coplanar PCBs, they may not be sufficient to determine the source of these

contaminants. Trustees propose addressing some of these potential data gaps." Detection of PCBs does not confirm exposure is Site-related (Integral 2021). It is also unclear how additional sampling downstream of the Site will address source of COPCs and resolve these data gaps.

- It is not possible to understand the value of additional data collection without also understanding potential restoration opportunities and costs. The need for potential data collection to refine injury determination may be completely offset by identifying effective and efficient restoration opportunities.
- The NRDA Plan for collecting additional data will not achieve the stated objectives.
  - For instance, additional fish tissue data collection as described would not achieve the stated goal of identifying fish contaminant sources.
  - As previously discussed, fish tissue data are inappropriate for forensic analysis due to differences in congener uptake and depuration rates, as well as confounding factors such as species, age, size of fish, and home range.
  - The identification of NRD injury has not established potential migration pathways from the Site to natural resources that would result in an observed injury.
  - The rationale for collection of depositional sediment data is unsupported. It would be inappropriate to use sediment depositional data in non-depositional areas as representative of potential exposure for the purpose of injury quantification, particularly in an HEA framework. Furthermore, the decision to collect sediment cores is based on fish tissue data, which as previously discussed are a poor indicator of localized concentrations. It is unclear how depositional sediment data will be used in the injury quantification.
- The proposed sampling does not consider the following:
  - The proposed fish sampling locations do not account for potential sources to the Clark Fork River downgradient from the Site, for example, the Flathead River, which joins with the Clark Fork River between two proposed sample locations.
  - The NRDA Plan includes no consideration of ecological characteristics of selected species. Fish home range, population dynamics, and other features can have significant impacts on reliability of using fish tissue as an indicator of a specific area's concentration.
- The proposal for collecting additional groundwater data is not supported.
  - Previous groundwater and Clark Fork River investigations have sufficiently evaluated the potential extent of COPCs present in groundwater discharge to the Clark Fork River.
    - Extensive monitoring results show that dioxins, arsenic, manganese, and iron are the primary COPCs in shallow groundwater. PCBs, VOCs, SVOCs, and other metals are not present in shallow groundwater onsite at concentrations above risk-based

standards or background levels (NewFields 2021b; USEPA 2020a,b,c). Despite the presence of certain COPCs in shallow groundwater, only manganese has been observed in the Clark Fork River at concentrations above an SMCL, which is an aesthetic guideline.

- There is no evidence for potential injury to groundwater (as a resource) or Osprey at the Site; therefore, further investigations for the purposes of injury assessment are unsupported.
- Extractive services of downgradient groundwater do not appear to be impaired. Ecological services of groundwater are included in other sections of the NRDA Plan. Groundwater as a resource should be dropped from the assessment.
  - Groundwater services include extractive services when groundwater is used for irrigation, industrial, or other uses now or in the future, and ecological services when groundwater services as a pathway by which contaminants reach other receptors.
  - The Trustees are addressing potential loss of ecological services of groundwater based on evaluations of habitats, biota, and human use. Therefore, a separate groundwater assessment would be duplicative.
  - The NRDA Plan states that a method such as an REA could be used to conduct an additional assessment for groundwater. This could lead to a double recovery of damages associated with ecological services.
  - There is no evidence of potential loss of extractive uses of groundwater at the Site.
- There is no evidence that Osprey or similar passerine species are a potentially injured resource at the Site. Proposed collection of Osprey eggs has no basis and is unwarranted.
  - EPA's final BERA (USEPA 2021b) concluded no risks to Osprey or Kingfishers from any COPEC using conservative dietary exposure modeling assumptions and data collected in sediment, surface water, and rainbow trout compared with conservative literature-based toxicity data at the lowest-observed-adverse-effect-level.
  - The only COPEC to even exceed the no-observed-adverse-effect-level toxicity values for piscivores were mercury and methylmercury (hazard quotients of 1.9 and 1.5 respectively), which are known to have significant sources in the Clark Fork River upstream of the Site.
  - Previous Osprey egg research cited in the NRDA Plan did not find evidence for injury from measured (elevated) concentrations of polychlorinated compounds (Elliot et al. 2001).

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Closing

We thank the Trustees for providing the opportunity to review and comment on the NRDA Plan. Please contact us if you have any questions or need clarifications.

Sincerely,

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Enclosure

Integral 2021
NewFields 2021a
https://newfields.sharefile.com/d-s703aaabbb6a745589d4860e4dfe75993

Potential Sources of PCBs in Clark Fork River Fish

Smurfit-Stone/Frenchtown Mill Site
Remedial Investigation/Feasibility Study
Report for PCB Source Evaluation

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
COPC	chemical of potential concern
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
FCA	fish consumption advisory
HDPT	High Density Pulp Tank
HHRA	human health risk assessment
Integral	Integral Consulting Inc.
IPC	International Paper Company
M2Green	M2Green Redevelopment Corp.
MCL	maximum contaminant level
MFWP	Montana Fish, Wildlife & Parks
NLFA	National Listing of Fish Advisories
OU	Operable Unit
PCB	polychlorinated biphenyl
POTW	publicly owned treatment works
PRP	potentially responsible party
RI Report	Remedial Investigation Report
RI/FS	remedial investigation and feasibility study
RSL	regional screening level
SAP	sampling and analysis plan
SI/RA	site inspection and removal assessment
Site	former Smurfit-Stone/Frenchtown Paper Mill, in Frenchtown, Montana
TEQ	toxicity equivalence
TSB	Transformer Storage Building
WestRock	WestRock CP, LLC
ww	wet weight
WWTP	wastewater treatment plant

EXECUTIVE SUMMARY

This report assesses the potential source(s) of polychlorinated biphenyls (PCBs) found in the U.S. Environmental Protection Agency's (EPA) 2018 and 2019 fish tissue studies. In 2018 and 2019, EPA Region 8 worked in collaboration with Montana Fish, Wildlife & Parks and others (EPA's Team) to design and conduct a study of tissue chemistry in fish collected from the Clark Fork River and selected tributaries. EPA reports finding dioxins, furans, and PCBs in tissues of rainbow trout (*Oncorhyncus mykiss*) and northern pike (*Esox lucius*).

Integral evaluated the potential source(s) of PCBs identified in EPA's 2018 and 2019 fish tissue studies by integrating and synthesizing several lines of evidence: 1) a summary review of available site-specific PCB data; 2) review of published data on common PCB sources in urban environments; and 3) a summary of PCBs in fish from other areas of Montana and the United States. These lines of evidence and the associated data support the conclusion that the Smurfit-Stone/Frenchtown Mill, a former pulp and paper mill in Frenchtown, Montana (Site), is not a source of PCBs in the Clark Fork River.

SITE-SPECIFIC PCB DATA

Site investigations have been specifically designed to find potential PCB source areas. Site PCB soil characterization data show PCB detections in discrete areas in Operable Unit 2 (OU2), that have since been removed, and at very low concentrations in soil and groundwater in limited areas of OU3. In OU2, PCB-impacted soils were found in two isolated locations at levels above the residential soil screening level in surface soil, and above commercial worker screening levels in deeper soils. In OU3, PCBs were rarely detected in soil and, when detected, only at very low concentrations (i.e., well below the residential soil screening level of 0.240 mg/kg for Aroclors 1254 and 1260). PCBs have not been detected in sediment samples from LaValle Creek, O'Keefe Creek on the Site, or the Clark Fork River adjacent to the Site. Detections of PCBs in surface water were limited to one location in the Clark Fork River upstream of the former Frenchtown Mill, as Aroclor 1221. Of the 93 groundwater samples analyzed for Aroclors, Aroclor 1260 was the only Aroclor detected in nine samples from three wells, and all detections were below the EPA maximum contaminant level of 0.5 µg/L. EPA does not consider PCBs to be chemicals of potential concern in Site groundwater, and PCBs were not included in groundwater risk evaluations in EPA's 2018 Draft OU2 or OU3 human health risk assessments (HHRAs) or the December 2020 Draft OU2 or OU3 HHRAs.

Results of PCB sampling on Site indicate that the limited PCBs in soil onsite have not impacted water and sediment in the Clark Fork River. Two small, localized areas of PCBs in soil were identified within OU2, in an area located approximately 1 mile away from the Clark Fork River. These PCB-impacted soils have been removed, and surrounding soils in the immediate area do not contain significant PCB contamination (i.e., below residential screening levels in surface soil

and below industrial screening levels in deeper soils). EPA's Draft OU2 HHRA reports that estimated risks and hazards to potential human receptors, including hypothetical future residents, commercial/industrial workers, and construction workers exposed to soils in OU2, do not exceed EPA health guidelines. Results of sampling for PCBs in soil, groundwater, sediment, and surface water do not suggest that the former mill is a source of PCBs. In addition, no transport pathway to the Clark Fork River has been identified.

FISH TISSUE PCB DATA

EPA's fish tissue sampling program detected PCBs in every fish tissue sample collected, both upstream and downstream of the Site. PCBs are present throughout the Clark Fork River watershed, including areas with relatively low levels of human development and upstream of the Site. Total PCB concentrations in rainbow trout fillet were comparable to or lower than those in similar fish tissues collected elsewhere in the western United States, including areas near towns and smaller cities, and not confined only to waterways of large cities. These findings are consistent with EPA's 2018 and 2019 data for PCBs in fish tissue data and with scientific literature that has identified PCBs associated with urban environments, such as wastewater treatment plants and urban stormwater, and not specifically associated with an industrial PCB source.

Low-level contamination extending downstream in the Clark Fork River is difficult to detect in sediments and water but presence in fish tissue is common. As PCBs are bioaccumulative and persistent chemicals, they accumulate within developed waterways and biomagnify in the aquatic food web, even when concentrations in sediment and water are relatively low or not detected, as in the Clark Fork River. Data from other parts of the northwestern United States, including in small cities located along rivers (like Missoula) and in even less developed areas, indicate that PCB contamination of fish in such environments is common. Concentrations of total PCBs in fillet tissue of fish collected by EPA in the Clark Fork River and its tributaries are within the range of total PCBs in fillet samples from rainbow trout and other salmonid species collected near small and large developed environments elsewhere in the northwest United States.

COMMON SOURCES OF PCBs IN URBAN ENVIRONMENTS

PCBs have been used in building materials and electrical equipment and have therefore been part of urban environments since the 1930s. Based on the incremental risk evaluation presented in the comments to EPA on the Draft OU3 HHRA, it is highly likely that the PCB concentrations in fish tissue, and associated risks, from the Frenchtown reach of the Clark Fork River are from sources located upstream of the Site that may include impacts from the City of Missoula stormwater discharges, City of Missoula wastewater treatment plant discharges, and other developed/urban sources. This aligns with EPA's statements in the 2020 Draft OU3 HHRA that

"together these findings indicate that there may be non-Site related inputs [of PCBs] associated with the City of Missoula contributing to the concentrations of toxicity equivalence (TEQ) in fish collected from the FRN/STR reaches." Thus, EPA recognizes there is a major non-Site source of PCBs in the Clark Fork River.

CONCLUSION

Neither the manufacturing history of the former mill nor the available soil, groundwater, sediment, and surface water data collected in support of the remedial investigation suggest that the former Frenchtown Mill is or ever was a source of PCBs to the Clark Fork River. The source of PCBs in fish captured by EPA in 2018 and 2019 in Missoula and locations downstream is not from the former Frenchtown Mill based on the following evidence: (1) combination of elevated concentrations in rainbow trout tissue associated with samples from Missoula and downstream, (2) a history of widespread PCB contamination from municipal sources and publicly owned treatment works effluents documented in the literature and described by EPA's public information websites, (3) independent studies of other human developments finding PCBs to be ubiquitous in fish tissue collected near developed environments, and (4) the absence of a clear Site source or transport pathway for PCB-contaminated media to the Clark Fork River. The fish tissue results indicate that the City of Missoula is the most likely source of elevated PCBs observed in Clark Fork River fish collected there and at downstream locations in the Clark Fork River.

1 INTRODUCTION

WestRock CP, LLC (WestRock), International Paper Company (IPC), and M2 Redevelopment Corp (M2Green), the potentially responsible parties (PRPs), are participating in a remedial investigation and feasibility study (RI/FS) with the U.S. Environmental Protection Agency (EPA) for the former Smurfit-Stone/Frenchtown Paper Mill, in Frenchtown, Montana (Site). In 2015, EPA entered into an agreement with WestRock, IPC, and M2Green to perform the RI/FS. This document provides a synthesis of information on polychlorinated biphenyls (PCBs) in environmental media on and near the Site to evaluate whether the former Frenchtown Mill could be a source of PCBs in fish tissue collected from the Clark Fork River. This analysis will support the comprehensive source evaluation to be presented in the Remedial Investigation Report (RI Report) for the former Frenchtown Mill.

1.1 BACKGROUND

In 2018 and 2019, EPA Region 8 worked in collaboration with Montana Fish, Wildlife & Parks (MFWP) and others (EPA's Team) to design and conduct a study of tissue chemistry in fish collected from the Clark Fork River and selected tributaries. EPA's Team prepared two sampling and analysis plans (SAPs; USEPA 2018, 2019a) and collected and analyzed composite samples of fillet (edible tissue) and carcass (remainder following resectioning for fillet) of rainbow trout (*Oncorhyncus mykiss*) and northern pike (*Esox lucius*). Over the 2018 and 2019 sampling events, fish tissue samples collected from eight locations in the Clark Fork River watershed were analyzed for PCBs, dioxins and furans, and lipid content (Figure 1-1). Six sampling locations were upstream of the Site (Greenough, Clinton, Lolo, Florence, Missoula, and Council Grove), and two sampling locations were downstream of the Site (Frenchtown and St. Regis). In 2018, rainbow trout were collected at Greenough, Clinton, Florence, Missoula, Council Grove, Frenchtown, and St. Regis, and northern pike were collected at Council Grove, Lolo, Missoula, and Frenchtown. In 2019, rainbow trout samples were collected at Florence, Missoula, Council Grove, Frenchtown, and St. Regis reaches, and northern pike samples were collected at Council Grove, Lolo, and Frenchtown reaches.[1] Although the name of the reach for the 2019 sampling event may be the same as the 2018 sampling event, the exact location of the 2019 reach may vary slightly or consist of only a portion of the 2018 reach (see Figure 1-1).

The PRPs have performed reviews of the EPA's 2018 and 2019 SAPs, and recorded observations of some sampling and sample processing activities. The PRPs were not represented in discussions of the purpose, scope, and approach for the work, and were not provided the opportunity to comment on drafts of the SAPs. Reporting by the EPA on the data to date has included data sharing, data usability evaluation reports (USEPA 2019b, 2020a), and reporting

[1] Reaches as defined in EPA's 2019 fish tissue data usability report (USEPA 2020a).

summary information in project meetings with PRPs and to the Community Advisory Group. The EPA has included the 2019 fish tissue data in recently updated 2020 risk assessment reports required for the remedial investigation, with the 2018 data only considered as part of the uncertainty analysis. However, EPA has recently stated that risk assessments will not address the issue of contaminant sources and will be considered within the remedial investigation.

1.2 OBJECTIVES

EPA's inclusion of PCBs in risk assessments for consumers of fish or to the fish themselves in reports generated for the remedial investigation seems to imply an association between the Site and the PCBs in fish collected from the Clark Fork River. However, the history of Site operations and available empirical evidence do not support this assumption. In addition, the current Operable Unit 3 (OU3) Human Health Risk Assessment (HHRA) (USEPA 2020c) states, "the statistical tests determined that in all cases [total PCBs and TEQ; rainbow trout and northern pike; whole body and fillet] except for whole-body rainbow trout, **Site concentrations [of total PCBs] were statistically equivalent with upstream concentrations for fish collected from the COG/MIS reaches … Whole-body rainbow trout TEQ_{PCB} concentrations** were statistically higher for samples collected from the Site (FRN/STR) when compared to all upstream samples [all upstream reaches combined] or when compared to samples collected from the LOL reach, **but not when compared to samples collected from the COG/MIS reach.** Together these findings indicate that **there may be non-Site related inputs associated with the City of Missoula contributing** to the concentrations of TEQ in fish collected from the FRN/STR reaches." *(emphasis added),* thus indicating that EPA recognizes major non-Site sources of PCBs in the Clark Fork River.

The objective of this report is to summarize and synthesize available data from studies involving sampling for PCBs that have been performed by EPA or as part of the remedial investigation, and to address whether the Site could be a source of PCBs to fish tissue collected from the Clark Fork River. This assessment will be incorporated into the source evaluation section of the RI Report.

1.3 REPORT OVERVIEW

This report presents:

- A comprehensive summary of available PCB data generated for the RI
- Discussion of literature on PCBs in environmental media from areas with significant human development, like the Missoula valley
- Discussion of literature and survey results on PCBs in Montana and across the United States.

This evaluation addresses whether there is any evidence of an empirical association between PCBs present in fish from the Clark Fork River with the former Frenchtown Mill.

2 SUMMARY OF AVAILABLE PCB DATA

Environmental media were collected from the Site or from nearby areas and analyzed for PCBs as part of the following EPA-approved studies supporting the remedial investigation:

- 2011 EPA Region 8 Site Inspection and Removal Assessment (SI/RA) (USEPA 2012)
- 2014 NewFields Site Investigation (NewFields 2014)
- 2015 Remedial Investigation (NewFields 2016)
- 2016 Shallow Groundwater Sampling Event (June) (NewFields 2017a)
- 2016 PCB Soils Investigation in OU2 (NewFields 2017b)
- 2017 Construction Completion Report (NewFields 2018a)
- 2017 Supplemental Soil Sampling (NewFields 2018b).

These documents present results of sampling and analysis of surface and subsurface soil, groundwater, surface water, and sediment for PCB Aroclors and, in a subset of soil samples, for PCB congeners. Data generated for EPA's SI/RA (USEPA 2012) are not included in the project database by prior agreement with EPA, because data quality information is incomplete. Results from USEPA (2012) are useful for this report to show where soil samples have been collected and analyzed for PCBs, and where PCBs were reported as detected or not detected in that study.

In addition to the published data sets listed above, data presented and analyzed in this report include PCB data for fish tissue generated by EPA's 2018 and 2019 tissue sampling efforts. To date, EPA has not prepared a comprehensive report of this information; supporting documentation is presented in EPA's SAPs (USEPA 2018, 2019a), data usability evaluation reports (USEPA 2019b, 2020a), and HHRA for OU3 (USEPA 2020c).

This section briefly summarizes the available PCB data for the Site (summarized in Table 2-1) and illustrates sampling locations. NewFields (2017d) has previously summarized PCB data for the Site; this document incorporates that review and updates it with soils data collected in 2017 and later to support risk assessments. A comprehensive description of the nature and extent of PCB contamination on the Site will be prepared for the Site RI Report.

2.1 SOIL

Data describing the concentrations of PCBs as Aroclors and congeners are available from several studies for surface and subsurface soils. Sampling depths for these soils have varied. In the summary below, "surface soil" refers to samples with an upper depth of 0 in., "subsurface

soil" has an upper depth of > 0 in. Actual depths of each sample are not enumerated in the summary below; related details include:

- 2011 EPA Region 8 SI/RA (USEPA 2012):
  - Surface: 0–24 in., as discrete samples
  - Subsurface: > 24 in., as discrete samples
- 2014 NewFields Site Investigation (NewFields 2014)
  - Surface: 0–2 in. (on ancillary parcels, as five-point composites within one square meter)
  - Subsurface: 0–6 in. (irrigation ditch—composites of five subsamples collected every 50 ft along the proposed irrigation ditch route ("HP-18-ditch"), and of five subsamples equally spaced in the area proposed for irrigation water infiltration in HP-18 ("HP-18 IB"), and from discrete locations in wastewater treatment system ponds)
- 2015 Remedial Investigation (NewFields 2016)
  - In OU1 and OU3: 0–2 in. and 5–7 in., collected as five-point composites within 1−3 square meters
  - In OU2: five-point composite from 0–2 in. below ground surface (bgs) (to evaluate airborne deposition); opportunistic test pits: discrete samples collected 12–24 in. bgs
- 2016 PCB Soils Investigation in OU2 (NewFields 2017b):
  - High Density Pulp Tank (HDPT) area: several discrete samples from various depths collected as part of subsurface sampling with GeoProbe
  - Transformer Storage Building (TSB) area: several discrete samples from various depths collected as part of subsurface sampling with GeoProbe
- 2017 Construction Completion Report (NewFields 2018a)
  - Confirmation samples at depth within excavated areas
  - Backfill source sample from AG8 vicinity (within OU1)
- 2017 Supplemental Soil Sampling (NewFields 2017c), in OU2 only (EPA did not require PCB testing of samples collected from OU3 for this effort):
  - Surface: 0–6 in., as 20-point composites across 20-acre grids
  - Subsurface: 24–30 in., as discrete samples collected within specific grids in OU2.

In all of these studies except the 2017 supplemental soil sampling (NewFields 2017c), sampling in both surface and subsurface soils has been targeted at areas where PCBs were anticipated to occur based on the operational history of the former mill, and to identify potential source areas,

if any. The emphasis on the use of biased sampling designs (e.g., former transformer locations) for defining the nature and extent of PCBs provides confidence that potential source areas have not been missed.

2.1.1 Surface Soils

Surface soils have been collected in OU2 and OU3 using a variety of sampling methods and depth intervals.

2.1.1.1 Surface Soils in OU2

EPA conducted an SI/RA at the Site in 2011 (USEPA 2012). One of the explicit objectives of the SI/RA was to confirm suspected source areas (USEPA 2012). In this investigation, "surface" soils were collected as discrete samples from 0–24 in. bgs at 17 locations (Figure 2-1, USEPA 2012). A few of these locations were at the southern end of OU2 (Figure 2-1), and one (background) location was at the northwest corner of OU1. PCBs were not detected in any of the 17 samples collected in OU1 or OU2 in this investigation.

NewFields has also collected surface soils in several studies conducted for the remedial investigation (NewFields 2014, 2016, 2017b). These studies were designed in collaboration with EPA and conducted with EPA oversight. In these studies, surface soil samples were either collected as discrete samples or prepared as composites of multiple subsamples. These studies also used biased designs, focused on finding potential source areas (Figure 2-2).

Of the surface soil samples collected and analyzed for PCBs from 2014 through 2016 (Figure 2-2), PCBs were detected only in OU2. These detections were at isolated locations associated with the HDPT and TSB areas of OU2 (Figure 2-2; Table 2-1; NewFields 2017d, 2018a); some were above the EPA residential and industrial direct-contact regional screening levels (RSLs). As a result, a soil removal action was conducted in 2017 to remove a small volume of soil from the TSB and HDPT areas of OU2 and dispose of the material in the Missoula County landfill. Following removal, confirmation soil sampling was conducted in December 2017 in the areas where soil was excavated (NewFields 2018a). Clean soil from OU1 was used as backfill material. Data for post-removal sampling at the depth of excavation confirmed that contamination was below levels of concern to potential receptors at OU2 (Figure 2-3), including future construction workers at the sample collection depths. EPA's Draft OU2 HHRA reports that estimated risks and hazards to potential human receptors including hypothetical future residents, commercial/industrial workers, and construction workers exposed to surface soils in OU2 do not exceed EPA health guidelines (USEPA 2020b).

In 2017, the PRPs developed a supplemental soil sampling study design collaboratively with EPA to fill data gaps relevant to the HHRA. To generate soil samples representative for the purposes of the HHRA (NewFields 2017c), soil samples consisting of 20-point composites of

surface soil from 0–6 in. bgs were collected from across 20-acre areas defined within each grid unit (NewFields 2018b) in OU2. Nine such surface soil composite samples were collected in OU2 and analyzed for PCBs (both congeners and Aroclors), from Grid Units 1, 2, 4/7, 8, 9, 13, 14, 22, and 23 (Figure 2-4). Total PCB congener concentrations (sum of 209 congeners) ranged from 0.01 to 1.13 mg/kg. Samples were analyzed for nine PCB Aroclors and only two were detected. PCB Aroclor 1254 concentrations ranged from 0.0162 to 0.413 mg/kg and PCB Aroclor 1260 concentrations ranged from 0.0396 to 0.0445 mg/kg (NewFields 2018b, Figure 2-4, Table 2-1). The USEPA (2020b) HHRA evaluated the detected concentrations for both residential and commercial/industrial reasonable maximum exposure scenarios and found that "risks to potential human receptors from exposures to OU2 soils [including those risks from the limited detected PCBs] do not appear to exceed USEPA's health guidelines."

2.1.1.2 Surface Soils in OU3

In EPA's 2011 SI/RA, sampling within OU3 was targeted by EPA at spoils basins, primary settling ponds ("sludge ponds"), emergency spill ponds, locations suspected to have been the most potentially contaminated areas on the Site on the basis of existing information, and locations downwind of potential source areas as part of EPA's biased sampling design in an attempt to find source areas in the SI/RA. Although the results are included here the accuracy of EPA's data is uncertain because quality assurance records are incomplete. The 2011 soil data show low concentrations of PCB Aroclor 1254 and Aroclor 1260 (well below the residential RSL) detected in only 5 of the 17 surface soil samples (29 percent detection) (Table 2-1). All detections were in two areas within the upland portion of OU3, and outside the 100-year floodplain (Figure 2-1). All samples in which PCBs were detected were at a distance of more than 1,600 ft from the Clark Fork River (Figure 2-1, USEPA 2012). PCB Aroclors 1254 and 1260 were reported by EPA at concentrations ranging from 0.011 to 0.08 mg/kg and 0.1 to 0.35 mg/kg, respectively (Table 2-1), although exact concentrations are uncertain because data quality information is incomplete. Because USEPA (2012) used a biased sampling design, the relatively low frequency of detections and low reported concentrations in EPA's 2011 OU3 data set suggest that PCB contamination of Site surface soils is minimal.

PCBs were not detected in any of the 21 surface soil samples from OU3 collected between 2014 and 2016 for the RI (Figure 2-2). In the 2017 sampling event, EPA did not require analysis for PCBs in surface soil samples of OU3.

PCBs were not identified as a chemical of potential concern (COPC) in OU3 soil. The USEPA (2020c) Draft OU3 HHRA excluded PCBs as a COPC in soil because frequency of detection was low and concentrations were below risk-based screening levels.

2.1.2 Subsurface Soils

EPA has collected subsurface soil samples in both OU2 and OU3 (USEPA 2012; Figure 2-5) and as part of the remedial investigation (Figures 2-6 and 2-7), with a focus on OU2. Those locations sampled in OU3 for PCBs were primarily in the upland portion of that operable unit because of Missoula County restrictions on construction of buildings in the floodplain.

2.1.2.1 Subsurface Soils in OU2

In OU2, PCBs were detected in subsurface samples collected between 2014 and 2016, including in the HDPT area and TSB area (Figure 2-6). Subsurface samples in the HDPT area of OU2 collected in 2015 had PCB Aroclor concentrations above EPA residential RSLs in surface soils and above industrial direct-contact RSLs at depths greater than two ft bgs (Table 2-1, NewFields 2017d).

Exceedance of RSLs in surface and subsurface samples collected from the HDPT in OU2 in 2015 lead to the PRPs voluntarily conducting a soil removal action which was completed in 2017 (NewFields 2018a). Subsurface soils in these areas were removed (Figure 2-3) and properly disposed at the Missoula County Landfill. PCB concentrations in confirmation soil samples collected following removal action in the HDPT and TSB areas of OU2 in December 2017 were all below soil cleanup levels agreed to by EPA as being protective of individuals under reasonably anticipated future uses (NewFields 2018a). Excavated areas were backfilled with EPA-approved clean soil (NewFields 2018a); a five-point composite sample was collected from the backfill material and analyzed for PCBs, and no PCBs were detected in this sample (NewFields 2018a).

In 2017, as part of the supplemental soil sampling effort, 10 discrete subsurface soil samples were collected in OU2 from a depth of 24 to 30 in. and were analyzed for PCBs (both congeners and Aroclors) (Figure 2-7; Table 2-1). Subsurface concentrations of PCBs in OU2 were all below the residential RSLs. EPA's OU2 HHRA reports that estimated risks and hazards to potential human receptors, including hypothetical future construction workers exposed to subsurface soils in OU2, do not exceed EPA health guidelines (USEPA 2020b).

2.1.2.2 Subsurface Soils in OU3

For the EPA SI/RA, subsurface soil samples were collected from eight locations in OU3, and PCB Aroclors were detected in three of the samples (Figure 2-5; Table 2-1) (USEPA 2012).

Of the subsurface soil samples collected and analyzed for PCBs in OU3 from 2014 through 2016, PCBs were detected in only 3 of 25 locations sampled (Figure 2-6). No subsurface soil samples from OU3 contained PCBs at concentrations above EPA industrial direct-contact RSLs (NewFields 2017d). Subsurface supplemental soil sampling to support risk assessment in 2017

did not include analysis of samples from OU3 for PCBs because of the lack of notable concentrations and lack of exceedance of applicable EPA RSLs in prior sampling events.

2.2 GROUNDWATER

Groundwater sampling for Aroclors was conducted during several sampling events from 2014 through 2019. Of 93[2] samples collected, Aroclor 1260 was detected in only nine samples, and six of these were "J-qualified" (estimated) by the laboratory, indicating that concentrations were too low to be quantified (NewFields 2020).

All detected concentrations of Aroclor 1260 were below the EPA maximum contaminant level (MCL) of 0.5 µg/L. EPA does not consider PCBs to be COPCs in OU3 groundwater, and PCBs were not included in groundwater risk evaluations in EPA's 2018 or 2020 Draft OU3 Human Health Risk Assessments. EPA and the Montana Department of Environmental Quality have since agreed to discontinue PCB sampling efforts (NewFields 2020).

2.3 CLARK FORK RIVER SEDIMENT

In 2015, nine sediment samples were collected in the Clark Fork River and its tributaries, O'Keefe Creek and LaValle Creek, as part of the RI sampling effort. Sediment samples were collected upstream of the Site in the Clark Fork River and its tributaries, adjacent to the Site in the Clark Fork River and its tributaries, and downstream of the Site in the Clark Fork River. All sediment samples were analyzed for PCB Aroclors. Of the nine sediment samples collected on the Clark Fork River and LaValle and O'Keefe creeks, none had detectable levels of PCBs (Figure 2-8, NewFields 2017d).

2.4 CLARK FORK RIVER SURFACE WATER

Surface water samples were collected in the Clark Fork River, O'Keefe Creek, and LaValle Creek as part of the RI sampling effort conducted in 2015. Surface water samples were collected upstream of the Site in the Clark Fork River and its tributaries, adjacent to the Site in the Clark Fork River and its tributaries, and downstream of the Site in the Clark Fork River. All surface water samples were analyzed for PCB Aroclors. Of the six surface water samples collected on the Clark Fork River, LaValle and O'Keefe creeks, only one surface water sample had detectable levels of PCBs; however, it was at an upstream location. This detection was recorded for surface water sample SW-5, collected in the Clark Fork River about two river miles upstream of the Site (Figure 2-8), which is considered to be a background location (NewFields 2017d). This upstream

[2] Based on sample counts within the Scribe database for the project.

sample had a concentration of Aroclor 1221 above the EPA chronic aquatic life standard (Figure 2-8). Aroclor 1221 has not been detected in any media samples associated with the Site.

2.5 CLARK FORK RIVER FISH TISSUE

In 2018, EPA collected northern pike and rainbow trout from the Clark Fork River and its tributaries, as described in the 2018 SAP (USEPA 2018). Because chain-of-custody forms and field quality control samples were missing for the 2018 sampling event, EPA collected additional fish in 2019 to address data gaps and uncertainties. The same sampling locations identified for the 2018 fish sampling event were targeted for the 2019 fish sampling event, (Figure 1-1, Table 2-2). Although the name of the reach for the 2019 sampling event may be the same as in the 2018 sampling event, the exact location of the 2019 reach may vary slightly or consist of only a portion of the 2018 reach.

2.5.1 Fish Sampling in 2018 and 2019

EPA's Team advanced similar study designs in 2018 and 2019, with sampling targets as follows:

- In 2018, EPA's Team sought four composites of rainbow trout fillet, and four composites of corresponding fish carcasses, with each composite containing five fish each, at Clinton, Missoula, Council Grove, Florence, Greenough, Frenchtown, and St. Regis. EPA also planned to collect four composites of northern pike of five fish per composite at Lolo and Frenchtown only.
- In 2019, EPA's Team sought four composites of both rainbow trout and northern pike fillet, and four composites of corresponding fish carcasses, with each composite containing five fish each at all locations sampled in 2018 except Florence.

These target sample numbers and actual numbers of fish captured and final sample counts resulting from these efforts are summarized in Table 2-2.

EPA's Team was not able to achieve all of its sampling goals, and it added a few opportunistic samples of northern pike (Table 2-2). Only one rainbow trout composite was collected in the Council Grove reach in 2018 and only two rainbow trout composites were collected in the Greenough reach in 2018. Although the 2019 study design targeted both species in Clinton and Greenough, these locations were not sampled in 2019 for either species. In 2018 and 2019, one northern pike was also collected from the Council Grove reach. One northern pike was collected from the Missoula reach in 2018, and none were collected there in 2019. No northern pike were collected at the St. Regis reach in either year. In addition, rainbow trout collected in 2019 that were previously characterized as from the Lolo reach were in fact collected from the Florence reach (Figure 1-1, Table 2-2).

2.5.2 Fish Tissue Concentrations

EPA has not yet prepared a report interpreting the fish tissue data, but the data were used in the risk assessments. A comprehensive discussion of the results of EPA's tissue sampling efforts will be presented in the RI Report. For the purposes of this report, some of the fish tissue results are summarized, as explained below.

2.5.2.1 Total PCB Concentration in Rainbow Trout and Northern Pike

Concentrations of total PCBs[3] as the sum of congeners in fillet tissue from both 2018 and 2019 were reported as follows[4]:

- Rainbow trout fillet: 1.23–28.9 µg/kg wet weight (ww)
- Northern pike fillet: 0.653–68.2 µg/kg ww.

Concentrations of total PCBs as the sum of congeners in carcass tissue from both 2018 and 2019 are as follows[4]:

- Rainbow trout carcass: 1.96–45.2 µg/kg ww
- Northern pike carcass: 3.09–301 µg/kg ww.

In general, carcass tissue has higher concentrations of PCBs and other organic contaminants than fillet tissue because such contaminants are often concentrated in the internal organs (e.g., liver) of the fish.

2.5.2.2 Total PCBs in Rainbow Trout Tissues

In general, fish tissue is a poor medium for evaluation of specific contaminant sources for a number of reasons discussed at the end of this section. However, EPA's decision to conduct risk analysis for PCBs in fish tissue as part of the Site investigation requires that potential PCB sources in fish tissue be addressed. Many organic chemicals (e.g., PCBs, dioxins/furans) in biota are unstable as metabolic processes affect tissue concentrations, which confounds source tracing. Fish tend to preferentially take up and metabolize the smaller, lower-chlorinated dioxins/furan congeners and dioxin-like PCBs (Opperhuizen and Sijm 1990) and therefore, dioxins/furans do not biomagnify or biomagnify weakly (Naito et al. 2003; Wan et al. 2005; Broman et al. 1992). Thus, source tracing and sometimes spatial patterns are difficult to assess for these chemicals using fish tissue data. In contrast, most PCB congeners are not readily

[3] EPA used laboratory-reported total PCB concentrations in the 2020 OU3 HHRA; although not specified in the HHRA, total PCBs appear to be calculated as the sum of congeners with nondetects assumed to be zero (ND = 0).
[4] Based on sample results within the Scribe database for the project.

metabolized through aerobic metabolic pathways and can biomagnify in fish tissue, allowing for source tracing and assessing spatial patterns for PCBs through biological tissue samples.

Integral Consulting Inc. (Integral) evaluated rainbow trout PCB tissue data generated by EPA's Team in 2018 and 2019 for spatial patterns. Northern pike results are not used because of low sample number and are excluded from mixing with the rainbow trout data because the bioaccumulation of PCBs by pike might differ in ways related to the species' biology or ecology from bioaccumulation by rainbow trout.

A plot of the mean and standard deviation in total PCB concentrations of each rainbow trout tissue type at each location sampled in 2018 and 2019 shows that sampling location has an important effect on PCB concentration (Figure 2-9). Spatial patterns of PCBs in rainbow trout show that total PCB concentrations in both fillet and carcass tissue are higher in Missoula, Council Grove, Frenchtown, and St. Regis than in the locations upstream of Missoula (Clinton and Greenough), and in locations upstream of the confluence of the Bitterroot River and Clark Fork River (Florence). The highest concentration of PCBs in rainbow trout fillet tissue was in 2018 at Council Grove. Although similar to Council Grove, the highest mean concentration of PCBs in rainbow trout carcass was in 2019 at Frenchtown (Figures 2-9 and 2-10).

The mean total PCB concentrations in both tissue types and in both years appear to be similar at the Council Grove, Frenchtown, and St. Regis reaches; tissues of rainbow trout collected from Missoula reach are only somewhat lower than from these three reaches. It is also worth noting that the rainbow trout collected in the Missoula reach in 2019 were in fact collected upstream of the Missoula urban area (Figure 1-1). PCB concentrations are noticeably lower in all other reaches (i.e., Florence, Clinton, and Greenough) not potentially influenced by Missoula (Figures 2-9 and 2-10).

Figure 2-11 shows results of an analysis using the approach reported by van der Maaten and Hinton (2008) to evaluate the similarity of PCB congener profiles in rainbow trout. In this figure, each point represents the PCB congener profile from one rainbow trout sample. Points that are closer together represent PCB congener profiles that are more similar to each other, and points that are farther apart represent more dissimilar congener profiles. As seen on Figure 2-11, rainbow trout samples appear to cluster into two groups based on patterns of PCB congener concentrations. The group of points at the top right of the figure shows that PCB congener profiles are similar in almost all rainbow trout samples from the Missoula, Council Grove, Frenchtown, and St. Regis reaches. The group of points at the bottom left of the figure shows that PCB congener concentrations are similar in all rainbow trout samples from the Clinton, Florence, Greenough, and Lolo reaches. Two samples from Missoula are found in the second group. This figure shows that PCB congener profiles in rainbow trout samples from these two groups are dissimilar from one another. This indicates there is a different profile of PCBs in rainbow trout collected at upstream reaches (Clinton, Florence, Greenough, and Lolo) versus reaches downstream of Missoula (Missoula, Council Grove, Frenchtown, and St. Regis). The

similarity among data points in the top right group of the figure indicates that samples from the Frenchtown reach are similar to samples from Missoula, Council Grove, and St. Regis. PCB congener profiles in Frenchtown rainbow trout samples are not distinctive in any way.

These observations support EPA's comparison (Table 3-27 of the Draft OU3 HHRA) of downstream site locations (FRN/STR) to immediately upstream locations (MIS/COG) that "the statistical tests determined that in all cases [total PCBs and all calculated TEQs; rainbow trout and northern pike; whole body and fillet] except for whole-body rainbow trout, Site concentrations were statistically equivalent with upstream concentrations for fish collected from the COG/MIS reaches … Whole-body rainbow trout TEQ_{PCB} concentrations were statistically higher for samples collected from the Site (FRN/STR) when compared to all upstream samples [all upstream reaches combined] or when compared to samples collected from the LOL reach, but not when compared to samples collected from the COG/MIS reach " (USEPA 2020c).

Integral found that potential risk from consumption of fish impacted by TEQ_{PCBs} and total PCBs collected near the Site (Frenchtown reach) is not incrementally different from that of upstream locations (i.e., Council Grove); details are provided in the comments to EPA on the Draft OU3 HHRA (Integral 2021).

In general, fish tissue is a poor medium for evaluation of contaminant sources for the following reasons:

- Wild fish are mobile, and the exposure regime of individuals and of groups captured in any given location cannot be known. Studies with less mobile fish, which control for known aspects of fish exposure and which include collection of various ancillary data (such as fish age, fish sex and breeding status, and/or stable isotopes of nitrogen or carbon and stomach contents) can generate results that improve certainty in understanding chemical sources, but such study design elements were not employed by EPA's Team.
- Rainbow trout are problematic as a means of source evaluation because their home range can be up to 20 miles, which is approximately the distance between Missoula and Frenchtown. This uncertainty means that trout captured in Missoula could have spent time near and further downstream of Frenchtown, and vice versa. Pinpointing sources using wild rainbow trout tissue samples is not possible. General evaluation of contaminant sources and source areas using highly mobile fish must be considered in light of this source of uncertainty.
- Northern pike are less mobile than trout, but other factors limit their use as a tool for source evaluation. Northern pike are highly opportunistic predators, ingesting a wide range of other fish species, which increases the likely variability in their exposure regimes. This variability limits between-location comparisons within this species. EPA's fish tissue study was not designed or executed in a manner that allows for

differentiating contaminant inputs of Missoula from those that may be associated with the former Frenchtown Mill, because it did not include sampling downstream of Missoula except at Frenchtown. EPA's Team tried to correct that problem during sampling, but sample sizes were ultimately too small in Missoula and Council Grove to be useful in overcoming this study design problem (Table 2-2). In addition, PCBs accumulate in fish with age; in the absence of age information, fish size can shed light on duration of exposure. The largest individuals were collected at the Frenchtown reach, and concentrations would likely be higher than in smaller pike with exactly the same exposure regime just on the basis of age. Higher PCB concentrations in larger specimens indicate a difference in exposure that can be explained by a longer duration in older fish. In addition, individual fish were composited into samples for chemical analysis in both EPA's 2018 and 2019 sampling efforts (USEPA 2019b, 2020a). This makes it impossible to make inferences based on potential correlations between the size or length of individual fish and the concentrations of PCB congeners in the fish.

Although fish that have longer lives and are highly mobile provide a poor tool for source evaluation of organic chemicals when relevant variables are not controlled in the study, as discussed above, PCBs as a group potentially allow for source tracing and assessing spatial patterns for PCBs through biological tissue samples provided the fish collection study was properly designed to identify sources.

2.6 SUMMARY OF AVAILABLE PCB DATA

PCBs have been analyzed in surface and subsurface soil samples collected on and near the former Frenchtown Mill for various sampling efforts over the past decade. Except for the 2017 supplemental soil sampling event, soil studies have been biased to identify potential source areas. Across all sampling efforts, the majority of PCB detections in both surface soil and subsurface soil were in OU2 (Figures 2-1 through 2-7). PCBs were rarely detected in soil samples from OU3, and when detected, were present in very low concentrations (USEPA 2020b,c; Table 2-1).

The two isolated areas with PCB concentrations in soil above industrial or residential RSLs occurred within OU2 and have been subject to a voluntary removal action. Soils remaining following the removal are in areas demonstrated to be surrounded by uncontaminated soil (NewFields 2018b); are covered with clean soil; and are bounded at depth by very low concentrations of total PCBs, which are below industrial RSLs (Figure 2-3). The affected areas of OU2 are located approximately one mile from the Clark Fork River.

In groundwater, Aroclor 1260 has been detected in 9 of 93 groundwater samples (six of these were "J-qualified" (estimated) by the laboratory) at concentrations below EPA's MCL (0.5 µg/L),

with all detections limited to three locations. In addition, all PCB detections in soil and groundwater were at least 1,600 ft and up to a mile removed from the Clark Fork River.

PCBs as Aroclors were not detected in sediment or water of the Clark Fork River, LaValle Creek, or O'Keefe Creek sampled in 2015, with the exception of one water sample collected upstream of the Site in which Aroclor 1221 was detected within the Council Grove reach (Figure 2-8).

PCBs were detected in fish tissue in all of EPA's 2018 and 2019 fish samples, even in those samples collected where no obvious industrial or urban source is present (e.g., Florence) (Figure 2-10).

3 PCBs IN DEVELOPED ENVIRONMENTS

PCBs are widely distributed in environmental media of the United States. PCBs were first manufactured in the United States in 1929 and had many commercial applications until 50 years later when further manufacture of PCBs in the United States was banned. Most PCBs manufactured and used in the United States consisted of mixtures of congeners sold under the trade name "Aroclor." Different commercial Aroclor products had distinct mixtures of the 209 PCB congeners (Frame et al. 1996a,b), and different industrial and commercial sources of PCBs frequently used different Aroclors. PCB compounds persist in the environment because they are resistant to degradation in water, sediment, and fish tissue (James and Kleinow 2014). Because they resist degradation, the patterns of PCBs found in environmental media frequently reflect the patterns of congeners in the original Aroclors. Different Aroclors were used for different purposes, and as a result, environmental media often contain mixtures of PCB congeners from several different Aroclors. The Aroclor and PCB congener data can be used to assist in understanding the patterns of contaminant distribution potentially related to different sources. Because they are persistent and are transported through the environment by several different pathways, PCBs are commonly found in environmental media in the built environment, including in the aquatic ecosystems within populated areas, and end up in tissues of aquatic organisms including invertebrates and fish. The presence of PCBs in developed environments is a widespread and recognized phenomenon (Needham and Ghosh 2019; Jing et al. 2019; Sethajintanin and Anderson 2006; Ecology 2003, 2019).

3.1 SOURCES OF PCBs IN MUNICIPAL ENVIRONMENTS

It is not necessary to have a hazardous waste site or location with uncontrolled industrial sources of PCBs to observe PCBs in environmental media of human-developed environments. Although each urban area will have specific facilities and circumstances contributing to PCB inputs to the ambient environment, some well-known sources of PCBs in urban environments are publicly owned treatment works (POTWs) and buildings constructed in the mid-twentieth century with PCB-containing construction materials (e.g., paint, caulk). These sources release PCBs through weathering and volatilization and generation of contaminated dust, which is transported by stormwater to waterways and sediments.

The 2019 fish sampling event at MIS occurred upstream of the Missoula urban area (Figure 1-1). Based on the 2019 fish tissue data, the contributions from the Missoula urban area appear to be impacting the COG reach sampling area given that it is directly downstream from the City of Missoula stormwater discharges and the City of Missoula wastewater treatment plant (WWTP).

Because these types of sources are common to many developed areas, they are discussed briefly in this section, providing perspective on the potential sources of PCBs in Clark Fork River fish. Specific sources within Missoula or the Missoula valley are not addressed.

3.1.1 PCBs in POTWs

POTWs such as WWTPs serving municipalities contribute PCBs to receiving waters and waterways through effluents (Rossi et al. 2004; Ecology and WDOH 2015; CWB 2012; Needham and Ghosh 2019; Jing et al. 2019). POTWs may also contribute PCBs to soils where biosolids originating in POTWs have been used as soil amendments (King County 2007). PCBs in POTW effluents and biosolids are thought to originate in dyes present in consumer products like clothing and soaps (Ecology 2016). PCB contamination within the Spokane River in Spokane, Washington, has been traced to WWTPs (Ecology 2011); studies conducted in 1992 reported WWTP discharges ranging from 3.8 to 260 mg/day of PCBs. Later work by Ecology found PCBs released from various POTW and industrial sources could be reduced substantially, but not eliminated (Ecology 2011). Stormwater inputs were ultimately targeted as the most important source to be controlled (Ecology 2011).

Needham and Ghosh (2019) sampled freely dissolved and particle-associated PCBs, to determine the inputs, fate, and outputs of PCBs at an urban POTW in the Baltimore, Maryland, area. The authors observed 170 g/day of PCBs entering the plant and 100 g/day and 5.2 g/day of PCBs exiting the plant associated with biosolids and as freely dissolved PCBs, respectively. Concentrations of freely dissolved PCBs in effluent were an order of magnitude above water quality criteria for protection of human health via fish consumption. Based on these findings, the authors concluded that POTW effluent was a significant source of dissolved PCBs in the receiving river.

Another study evaluated the potential for bioremediation to remove PCBs from POTW effluent in the Houston, Texas, area (Jing et al. 2019). The authors evaluated annual discharge of PCBs from a large POTW from both continuous effluent present during the dry season, and episodic effluent during precipitation events, from 2011 to 2015. They concluded that the majority of PCBs discharged to the river from this POTW came from continuous effluent discharges (Jing et al. 2019).

According to Ecology and WDOH (2015), POTW inputs account for almost 10 percent of PCB contributions to waterways statewide in Washington.

3.1.2 PCBs in Building Materials

According to websites maintained by EPA to provide the public with information, PCBs have had many industrial uses, including use in building construction materials. According to EPA:

> "EPA is concerned that there is potential widespread use of PCB-containing building materials in schools and other buildings constructed or renovated between about 1950 and 1979."[5]

While EPA's focus in its web pages on this subject is PCBs in schools and exposure to PCBs in air within schools, any buildings constructed during this defined time period are considered by EPA to potentially contain PCBs. EPA's more detailed reporting on this issue (USEPA 2012) cites fluorescent light ballasts as a particular concern, but also discusses sealants and caulking materials in its guidance to contractors. PCBs were mixed with caulk and other materials to stabilize them and extend the functional life of these building materials. EPA notes that sealants are a source of volatile air emissions of PCBs within buildings and may contaminate proximal building materials like wood and paint through air or contact pathways. EPA suggests that schools both ventilate and manage dust to prevent PCB exposures inside of affected buildings.

As a direct result of the uses in building materials, PCBs are found in soils surrounding buildings that contain PCB-contaminated caulk (Herrick et al. 2007), and likely in the air (Robson et al. 2010), where they may sorb to particulate dust or particulates from combustion. Studies of dusts in urban environments confirm that measureable PCB concentrations are found in dusts, at concentrations higher than in soils (e.g., Irvine and Loganathan 1998). Airborne dust particulates are carried to the earth by rain, where they are washed into the stormwater management system and to waterways and sediments. In Washington, stormwater flow is the most significant pathway for PCB transport to surface water bodies (Ecology and WDOH 2015).

3.1.3 PCBs in Urban Stormwater

Urban stormwater runoff is a source of PCBs in urban rivers (Sethajintanin and Anderson 2006; Hwang and Foster 2008). In one study, the authors sampled PCBs in surface water in an urban area upstream of a Superfund site and within the Superfund site and found that PCB congener profiles were similar at sampling locations in the industrial area of the Superfund site and at urban locations upstream of the Superfund site (Sethajintanin and Anderson 2006). These authors observed higher concentrations and daily loads of PCBs during episodic rainstorms, demonstrating the importance of both street dusts and precipitation in the transport of PCBs from urban terrestrial environments into waterways. The river system also had combined sewer overflows correlated with a high precipitation event, suggesting that sewers also contribute PCBs to urban surface waters (Sethajintanin and Anderson 2006).

PCB contamination of urban stormwater has also been described in small urban catchments in the Washington, DC, area (Hwang and Foster 2008) and in multiple urban areas of Switzerland (Rossi et al. 2004). It is a recognized concern in the Pacific Northwest (U.S.) (Ecology and WDOH 2015). Hwang and Foster (2008) found that particulate transport accounted for a

[5] https://www.epa.gov/pcbs/polychlorinated-biphenyls-pcbs-building-materials, accessed September 25, 2020.

significant fraction of the mass of PCBs in stormwater. Rossi et al. (2004) report that urban stormwater contributes a "major part" of the PCBs found in POTW sludges and in the environments they study.

3.2 PCBs IN FISH TISSUE FROM AREAS OF HUMAN DEVELOPMENT

Aggregation of PCB-contaminated particulates in sediments of aquatic environments affected by stormwater and POTWs will lead to contamination of the food web in affected ecosystems. Freely dissolved PCBs in urban surface waters are bioavailable and have the potential to be absorbed by and bioaccumulate in fish (Needham and Ghosh 2019; Sethajintanin and Anderson 2006). Multiple studies have demonstrated the presence of PCBs in freshwater fish from waterways in or adjacent to developed areas, including in towns and small cities (Ecology 2003, 2019). Several examples are available in peer-reviewed scientific papers as well as reports made by government agencies. The Washington State Department of Ecology (Ecology) conducts statewide monitoring programs that include remote areas and focused studies in the Spokane area, providing the most recent and most comprehensive view of PCBs in tissue samples collected across the state. Other data sets from elsewhere in the Pacific Northwest region also provide important context.

In a 2001 study, Ecology monitored contaminants in five species of freshwater game fish at locations around the state of Washington and found PCBs detected in 100 percent of samples of skin-on fillet tissue (Ecology 2003). Sampling locations were freshwater lakes and one river, with limited residential development along their shorelines (Table 3-1). Total PCB levels in fillet tissue samples from salmonids reported by Ecology (2003) ranged from 10.8 to 39 µg/kg ww. Fillet tissue from brown trout collected in Liberty Lake in this study had the maximum PCB concentrations for salmonids of 39 µg/kg (Ecology 2003).

Ecology (2003) compared results to historical fish contamination studies conducted in Washington and concluded that nearly all edible tissue that had been sampled for PCBs contained PCB concentrations exceeding the National Toxics Rule criteria for protection of human health and the EPA screening value for subsistence fishers (Ecology 2003). For example, the total PCB values observed in Liberty Lake, which is surrounded by homes on the north and by forested parklands on the south, were similar to levels found in trout fillets in urban areas in previous studies: 51 µg/kg ww in Mercer Slough, near the Seattle metropolitan area in 1992, and 46 µg/kg ww near Silverdale, Washington, in 1995 (Ecology 2003).

In a 2016 study, Ecology monitored contaminants in six species of freshwater fish in the Cowlitz River basin and found a high frequency of detection of PCBs. Land cover in the Cowlitz River watershed is predominantly public and private forestry, with about 5 percent agriculture and less than 1 percent urban/residential (Ecology 2019). PCBs were detected in fillet tissue of Cowlitz River cutthroat trout and mountain whitefish, with total PCB concentrations as the sum

of congeners ranging from 46 to 84 µg/kg ww. An additional sampling event conducted in this river basin included cutthroat trout and mountain whitefish as well as largemouth bass, northern pikeminnow, and rainbow trout, with total PCB concentrations ranging from 1.9 to 53.8 µg/kg ww (Ecology 2019).

Total PCB concentrations reported by EPA for trout fillet from the Clark Fork River watershed (USEPA 2020a; Section 2.5) fall within the range of total PCB concentrations reported for fillet tissue by these studies in Washington for various salmonids (Table 3-1). Although there are no perfect data sets for comparison to the Clark Fork River fish tissue samples, this comparison shows that a water body does not have to be in a large urban area to have PCBs detectable in edible tissues of trout and other salmonids. Data collected in other states, including Montana, also support this.

3.3 FISH TISSUE PCBs IN OTHER STATES

PCBs commonly occur in freshwater fish throughout the United States, in locations both close to and removed from large urban areas or other known PCB point sources. Although detailed statewide monitoring programs like Washington's are rare, other studies report widespread occurrence of PCBs in fish tissues collected from locations around the country. Notable examples are summarized below.

3.3.1 Montana

Maret and Dutton (1999) prepared a compilation of fish tissue data generated from 1974 to 1996 for Washington, Idaho, and Montana. Included in their summary is a statement that fish from the Flathead Lake had PCBs at levels higher than expected during sampling conducted in the 1990s, pointing to atmospheric transport of PCBs to this region of Montana as the likely explanation. According to Maret and Dutton (1999), the primary study (Phillips and Bahls 1994) reports lake trout fillet tissue from Flathead Lake ranging from 80 to 380 µg/kg ww. More recently, on April 30, 2014, EPA issued a statement (Gildea 2014) that PCBs in three water bodies of the Flathead Lake watershed were listed as impaired due to continuing concerns about PCBs in fish tissue. While part of the problem was attributed by Gildea (2014) to a contaminated site in that area, the statement did not provide a complete explanation of the details of sources or contamination patterns.

EPA's National Listing of Fish Advisories (NLFA) presents results of sampling that informs current fish consumption advisories (FCAs) by MFWP in Flathead Lake and elsewhere in Montana.[6] On the NLFA website, PCBs in lake trout samples from Flathead Lake are listed as ranging from 80 to 380 µg/kg (Station ID MT-2003-8; wet weight concentrations are assumed, as these values relate to an HHRA objective). In Whitefish Lake to the north, PCBs were not

[6] The NLFA website is https://fishadvisoryonline.epa.gov/FishTissue.aspx

detected in some lake trout samples, but the total PCB concentration in a sample of lake trout in the NLFA database for that location is 69 µg/kg ww. FCAs due to PCBs in sportfish tissue are currently in place for water bodies in several parts of Montana, including walleye in Holter Reservoir and brown trout in Martinsdale Reservoir, as shown on the "Fish Consumption Guidelines" document currently available on MFWP's "FishMT" website. These sampling locations are not specifically associated with an industrial PCB source.

In comparison, the total PCB concentrations measured in EPA's fish tissue study in fillet tissues of rainbow trout and northern pike collected in the Clark Fork River and tributaries ranged from 0.653 to 68.2 µg/kg ww (Table 3-1). The range of PCB concentrations observed by EPA in Clark Fork River fish is lower than the range of concentrations discussed above that have been reported in fish in Montana's Flathead and Whitefish lakes.

3.3.2 Other States

Maret and Dutton (1999), in their own literature review spanning the larger United States, describe PCB contamination of edible fish tissue as common in freshwater species. PCBs and DDT were the most commonly detected chemical groups; these chemicals along with chlordane and mercury together accounted for FCAs on 5 percent of river miles in the United States in 1994 (p. 15). Table 4-6 of the SAP for the 2019 fish sampling by EPA's Team summarizes fish tissue PCBs from a national survey. Across this broad range of species and habitats sampled, the mean PCB concentration is 1,898 µg/kg and the median is 209 µg/kg. A comprehensive literature review is beyond the scope of this report, but readily available summary information of this type demonstrates that PCBs have been widespread in fish of the U.S. The Flathead Lake example shows that elevated PCBs in fish tissue can be a persistent challenge.

4 SUMMARY AND CONCLUSIONS

Several lines of evidence were reviewed in this report to address whether the Site could be a potential source of PCBs to fish tissue collected from the Clark Fork River. The information reviewed included: :

- A summary of available data for PCBs for OU2 and OU3 of the Site
- Measured fish tissue data from the Clark Fork River
- Literature-based data showing that urban areas likely have several specific PCB sources, with contributions of PCBs over time spanning the decades since PCBs were invented
- Literature-based data on PCBs in fish tissue in other states and elsewhere in Montana.

These lines of evidence support understanding the likely sources of PCBs in Clark Fork River fish tissue.

4.1 SUMMARY

The former Frenchtown Mill did not use PCB-stabilized inks or dyes in its manufacturing process and did not recycle carbonless copy paper containing PCB-stabilized materials. The Site is therefore not anticipated to have significant PCB contamination. Sampling events to date have had biased sampling designs, and were targeted at finding contaminant source areas. Using a biased design results in a high degree of confidence when the study identifies no problem areas or source areas.

Soil sampling in OU2 and OU3 of the former Frenchtown Mill was targeted at locations where contamination would be expected based on the operational history of the former mill. PCBs were not detected in the majority of soil samples collected from the Site, nor in nearly every soil sample collected in OU3 (Figures 2-1, 2-2, 2-5, and 2-6). Site PCB soil concentrations are generally low or have not been detected with the exception of two isolated areas in OU2 approximately one mile away from the CFR that were remediated as a result of exceedances of the residential RSLs in surface soils and the industrial RSLs in subsurface soils. Of 93 groundwater samples, PCBs were detected as Aroclor 1260 in only nine samples from three locations (six of these detections were J-flagged (estimated)). Of these locations, the closest was 1,600 ft away from the Clark Fork River. PCBs were not detected in sediment or surface water of Site creeks, nor were they found in sediment or water of the Clark Fork River, with one exception in a water sample *upstream* of the former Frenchtown Mill. Therefore, results of PCB sampling for the Site investigation to date provide no indication that PCBs originating from the former mill site are impacting or have impacted water and sediment in the creeks or Clark Fork River. Further, there is no indication of a transport pathway from the small, localized areas of previous PCB contamination in soil to the Clark Fork River.

EPA's fish tissue sampling program found PCBs in every fish tissue sample collected, evidence that PCBs are present throughout the Clark Fork River watershed, even in areas with relatively low levels of human development. Total PCB concentrations in rainbow trout fillet were comparable to or lower than those in similar fish tissues collected elsewhere in the western United States, including areas near towns and smaller cities, and not confined only to waterways of large cities. EPA's 2018 and 2019 data for PCBs in fish tissues are consistent with those collected regionally.

On the basis of the pattern in total PCB concentration in rainbow trout, it appears that the City of Missoula may be contributing the majority of PCB mass in the Clark Fork River rainbow trout tissue samples evaluated. Evaluation of PCB congener profiles in rainbow trout indicates that samples from the Frenchtown reach are similar to samples from Missoula, Council Grove, and St. Regis. PCB congener profiles in Frenchtown rainbow trout samples are not distinctive in any way. This assessment is consistent with EPA's statistical comparison of downstream fish contaminant concentrations to immediate upstream concentrations in Missoula and Council Grove presented in the OU3 HHRA (USEPA 2020c). The 2019 fish sampling event at Missoula occurred upstream of the Missoula urban area (Figure 1-1). Based on the 2019 fish tissue data, the contributions from the Missoula urban area appear to be impacting the Council Grove reach sampling area given that it is directly downstream from the City of Missoula and the City of Missoula WWTP.

The presence of PCBs in aquatic ecosystems that are surrounded by significant human development, as is apparent in the trout data set evaluated here, is not unexpected based on common sources known to occur in developed areas and studies of fish elsewhere in the region. Weathering of buildings, formation of dust, and transport by stormwater or WWTPs lead to low-level PCB contamination in streams and rivers of various sizes in many locations, as shown by Ecology (2003, 2019) and other research (Needham and Ghosh 2019; Sethajintanin and Anderson 2006; Robson et al. 2010; Jing et al. 2019).

Results of the analyses and comparisons in this report are consistent with that research.

4.2 CONCLUSIONS

There is no indication of PCB contamination of soil or sediment associated with the former Frenchtown Mill that could be contributing to PCB contamination of fish in the Clark Fork River. The affected areas of OU2 were small, isolated, and located approximately one mile away from the Clark Fork River. The small and localized areas of soil contaminated with PCBs in OU2 have been removed, and surrounding soils in the immediate area do not contain significant PCB contamination. Results of sampling for PCBs in soil, groundwater, sediment, and surface water do not suggest that the former mill is a source of PCBs.

Based on the incremental risk evaluation presented in the comments to EPA on the Draft OU3 HHRA, it is highly likely that the PCB concentrations in fish tissue, and associated risks, from the Frenchtown reach of the Clark Fork River are from upstream impacts from the City of Missoula stormwater discharges, City of Missoula WWTP discharges, and other developed/ urban sources. This aligns with EPA's statements in the 2020 Draft OU3 HHRA that "together these findings indicate that there may be non-Site related inputs [of PCBs] associated with the City of Missoula contributing to the concentrations of TEQ in fish collected from the FRN/STR reaches." Thus, EPA recognizes there is a major non-Site source of PCBs in the Clark Fork River. The source of PCBs in fish captured by EPA in 2018 and 2019 in Missoula and locations downstream is not the former Frenchtown Mill based on the following evidence:
(1) combination of elevated concentrations in rainbow trout tissue associated with samples from Missoula and downstream, (2) a history of widespread PCB contamination from municipal sources and POTW effluents documented in the literature and described by EPA's public information websites, (3) independent studies of other human developments finding PCBs to be ubiquitous in fish tissue collected near developed environments, and (4) the absence of a clear Site source or transport pathway for PCB-contaminated media to the Clark Fork River.

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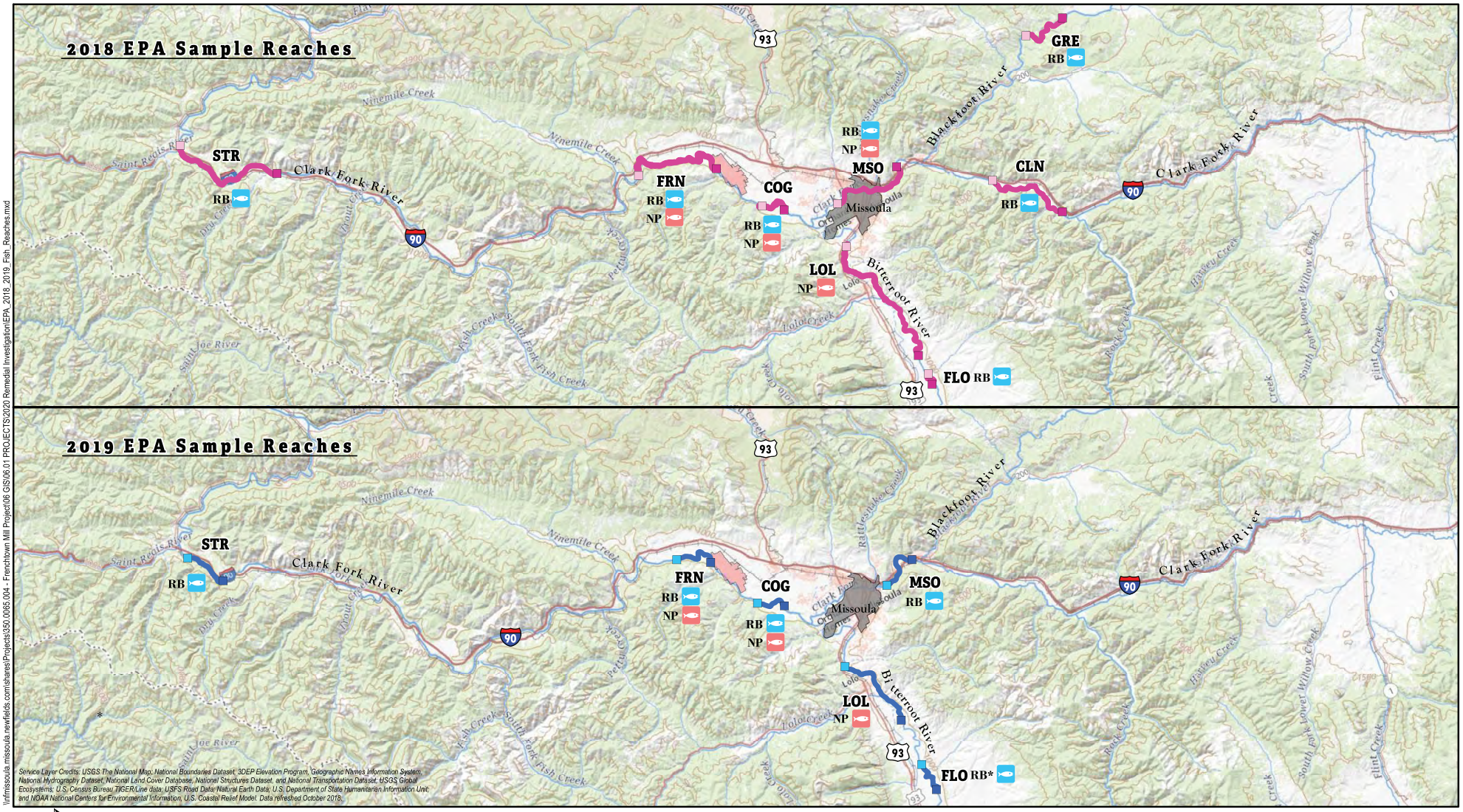
Figures



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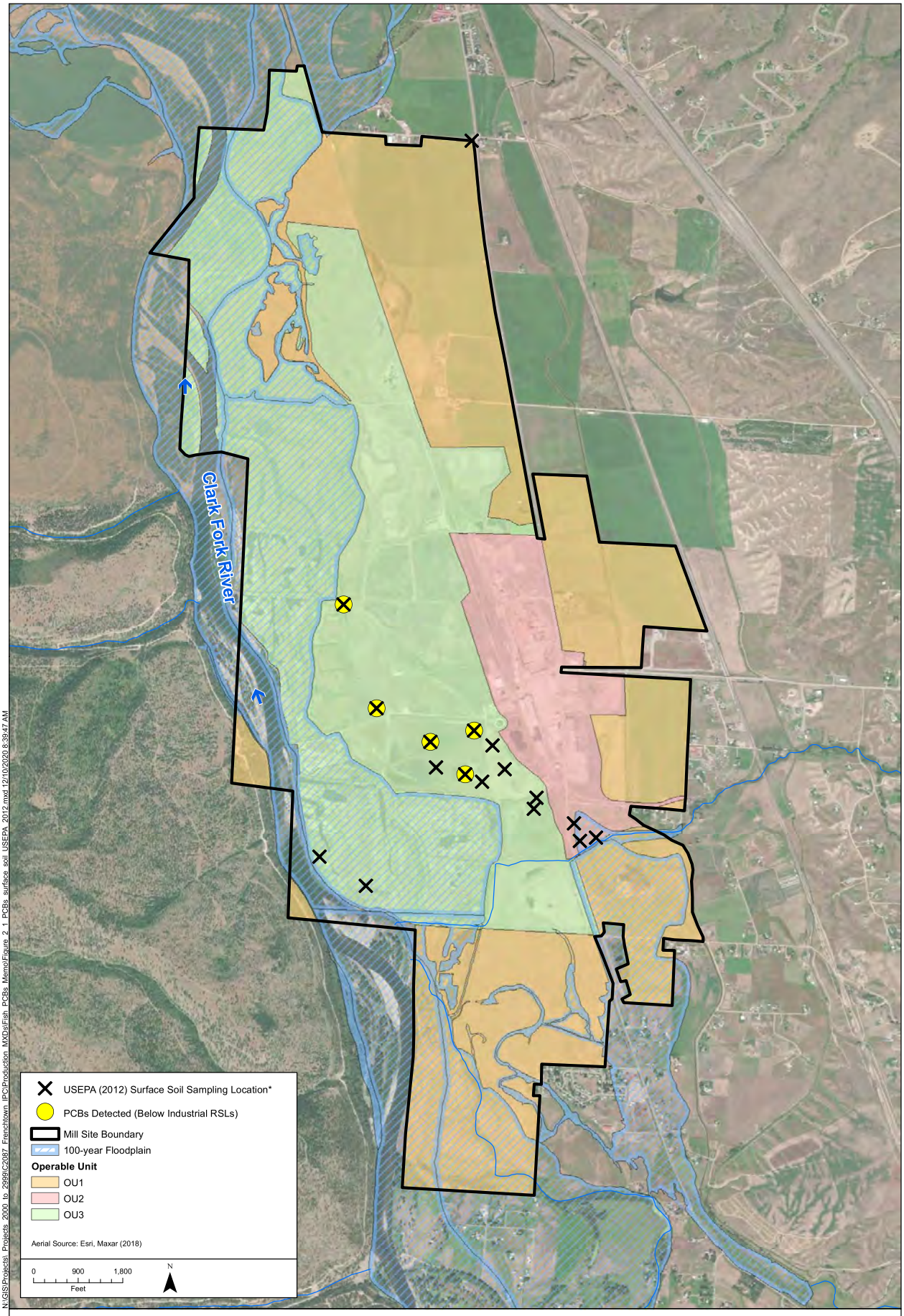
Notes:

* - EPA's Table 2-1 indicates that rainbow trout were sampled at LOL rather than FLO in 2019; however, the coordinates provided in EPA's worksheet correspond with the FLO reach as shown

See fish sample collection quantities in Tables 1 through 8 of EPA's *2018 Final Technical Memorandum Summary of the July 2018 Game Fish Sampling* and Table 2-1 in EPA's *Final Technical Memorandum Summary of the June 2019 Fish Samping Event Smurfit-Stone/Frenchtown Mill Site, Montana*

- Former Smurfit-Stone/ Frenchtown Mill Site
- City of Missoula
- 2018 Upstream
- 2018 Downstream
- 2018 Sample Reach
- 2019 Upstream
- 2019 Downstream
- 2019 Sample Reach
- RB Rainbow Trout
- NP Northern Pike

Locations of EPA's Fish Tissue Sampling, 2018 and 2019
Former Smurfit-Stone/Frenchtown Mill Site
Missoula County, Missoula
FIGURE 1-1



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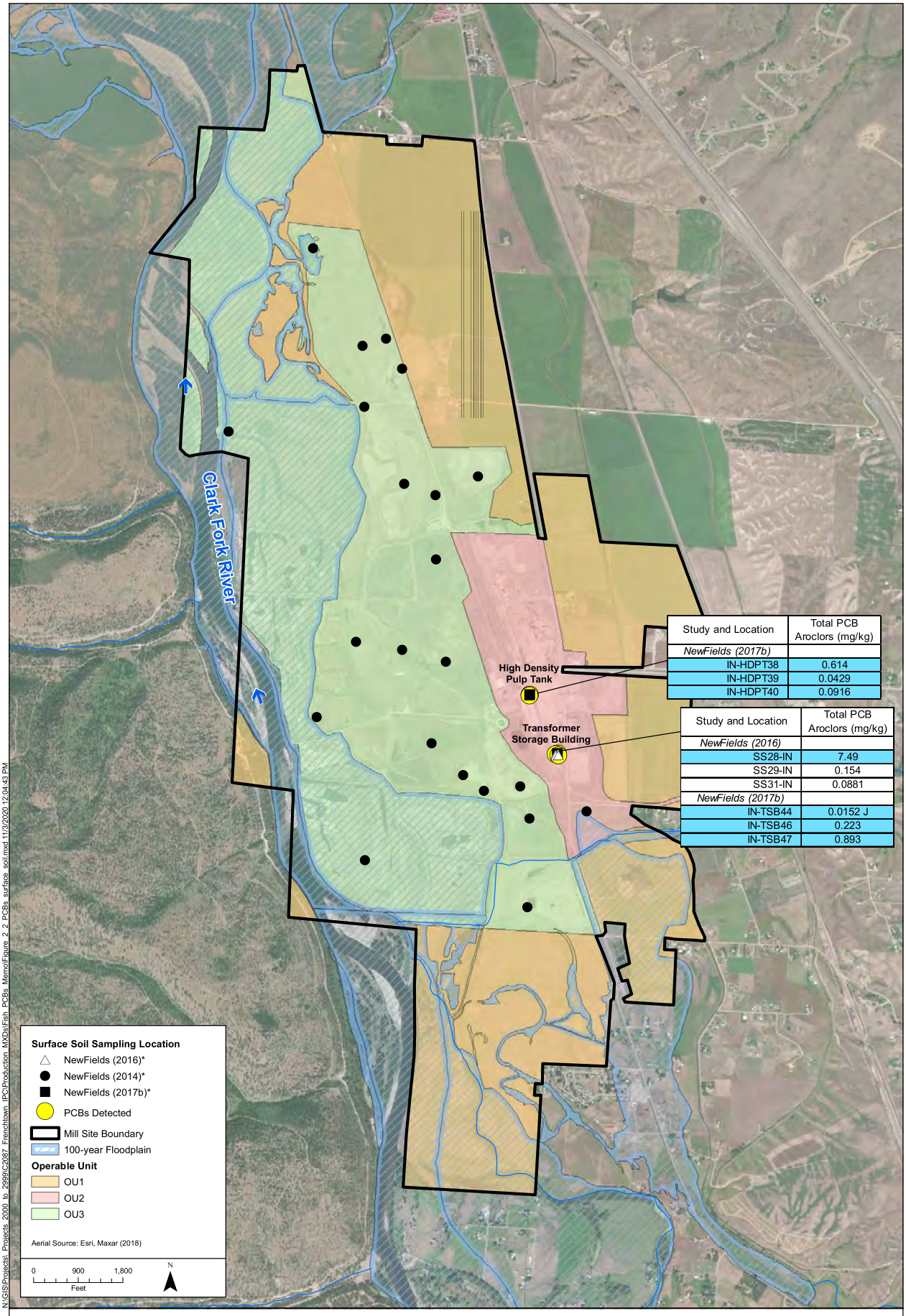
Note:
* A black symbol without a yellow highlighted symbol behind it indicates PCBs were not detected

Figure 2-1.
Locations of Surface Soil Samples and Aroclor Detections from USEPA (2012)



Study and Location	Total PCB Aroclors (mg/kg)
NewFields (2017b)	
IN-HDPT38	0.614
IN-HDPT39	0.0429
IN-HDPT40	0.0916

Study and Location	Total PCB Aroclors (mg/kg)
NewFields (2016)	
SS28-IN	7.49
SS29-IN	0.154
SS31-IN	0.0881
NewFields (2017b)	
IN-TSB44	0.0152 J
IN-TSB46	0.223
IN-TSB47	0.893

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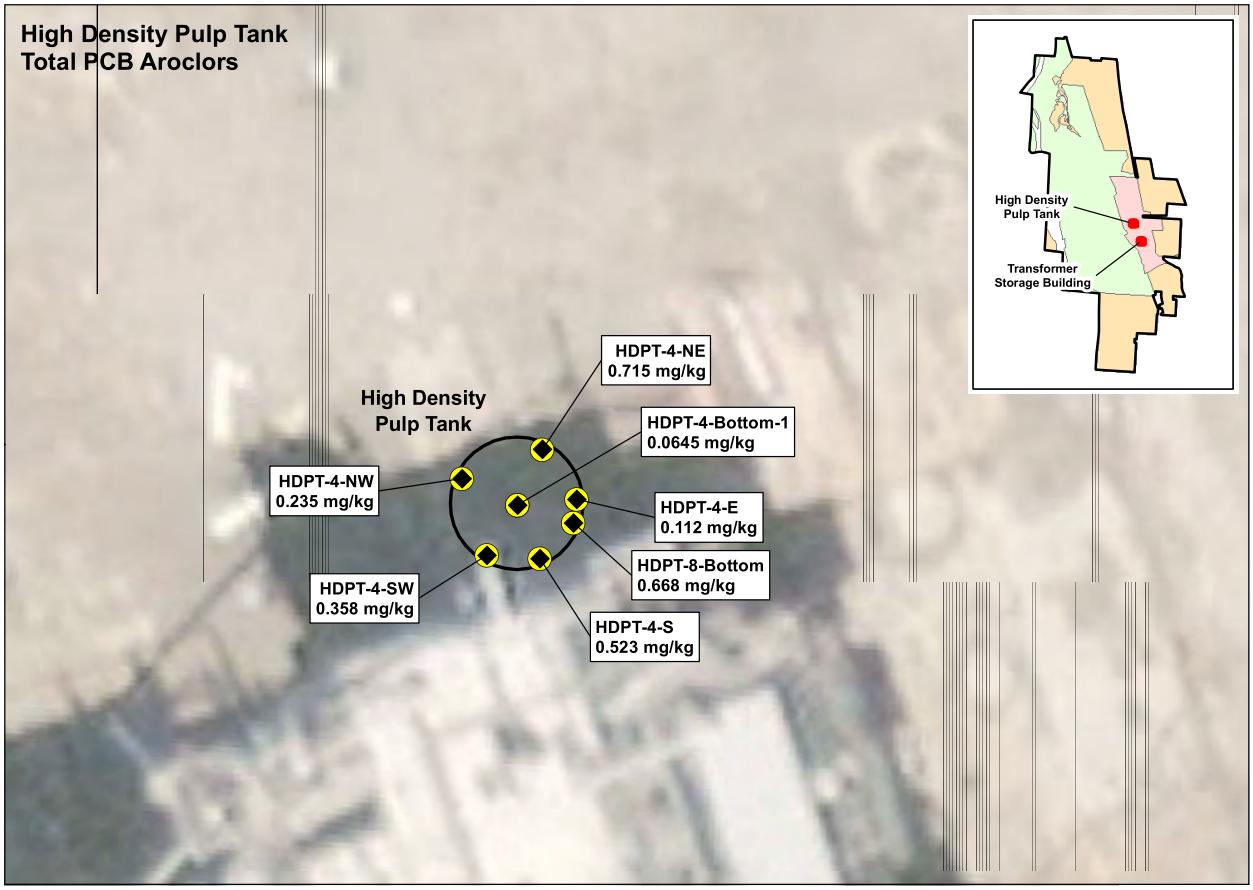
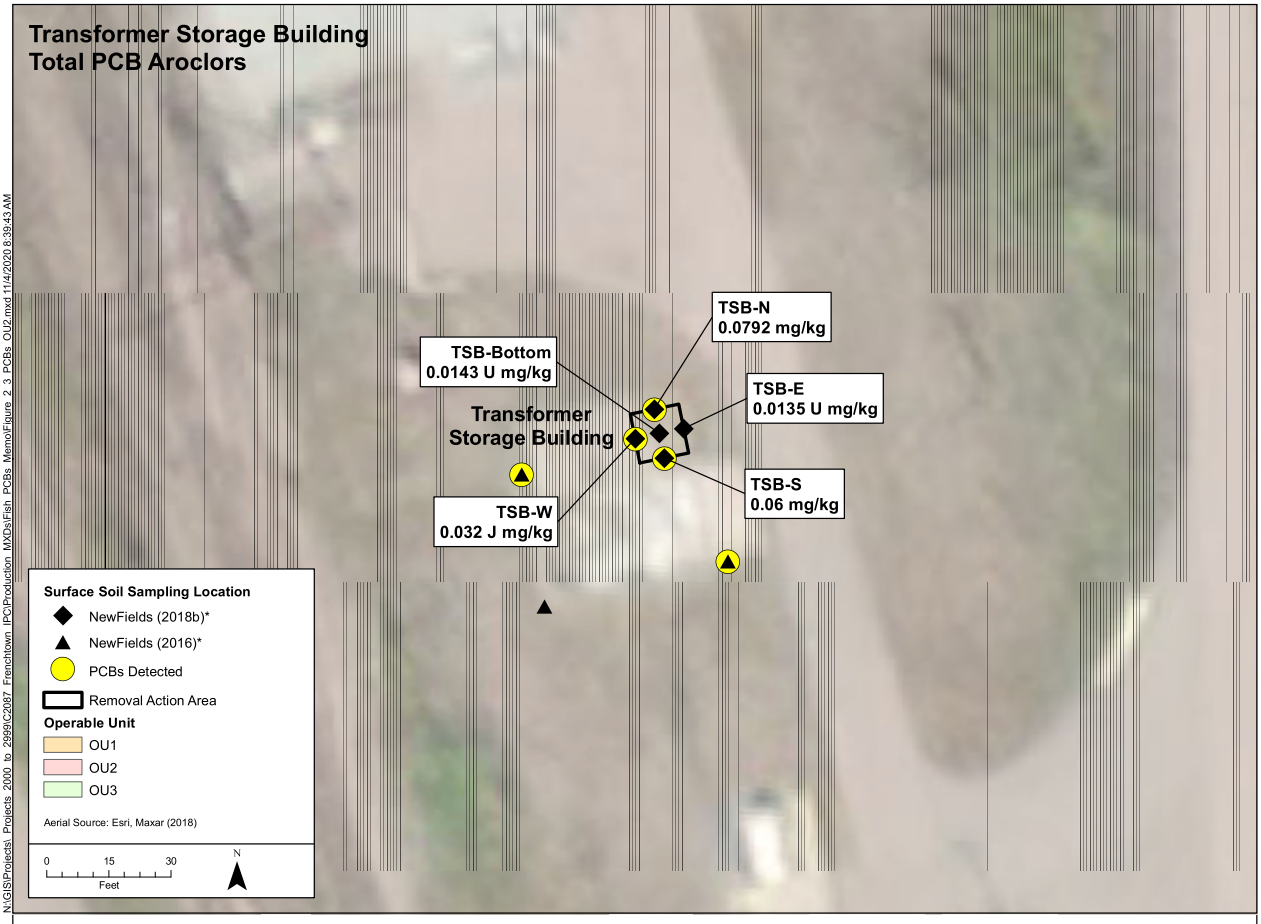
Notes:
1.* A black symbol without a yellow highlighted symbol behind it indicates PCBs were not detected.
2. Sample results highlighted in blue indicate PCB concentrations addressed by 2017 soil removal action (NewFields 2018b).
3. J = estimated value

Figure 2-2.
Surface Soil Sampling Locations for PCB Aroclors from the Remedial Investigation, 2014-2016





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Notes:
1. * A black symbol without a yellow highlighted symbol behind it indicates PCBs were not detected.
2. J = estimated value
3. U = not detected, reporting limit shown

Figure 2-3.
Results of Confirmation Soil Samples in the HDPT and TSB Area following the Removal Action

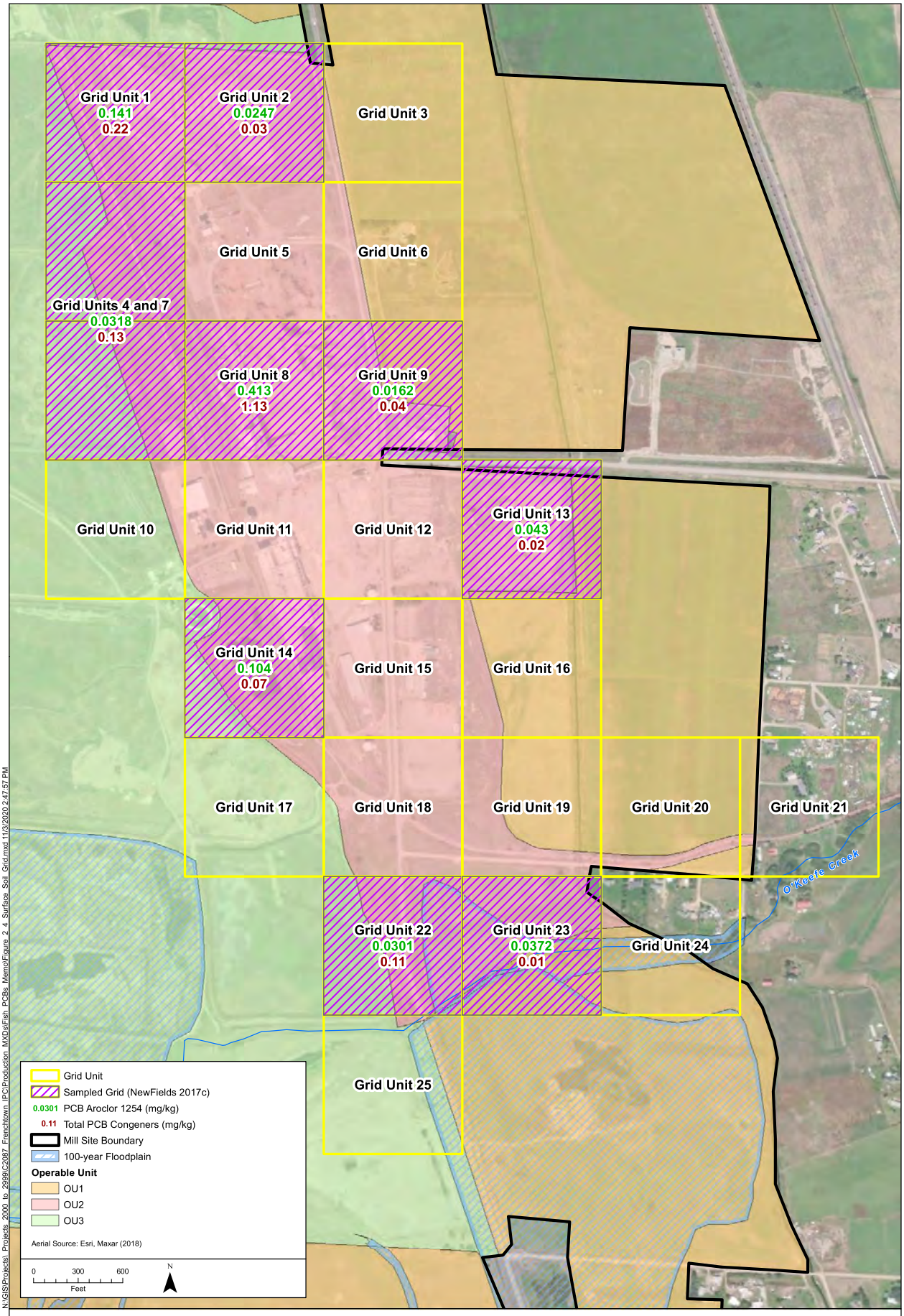

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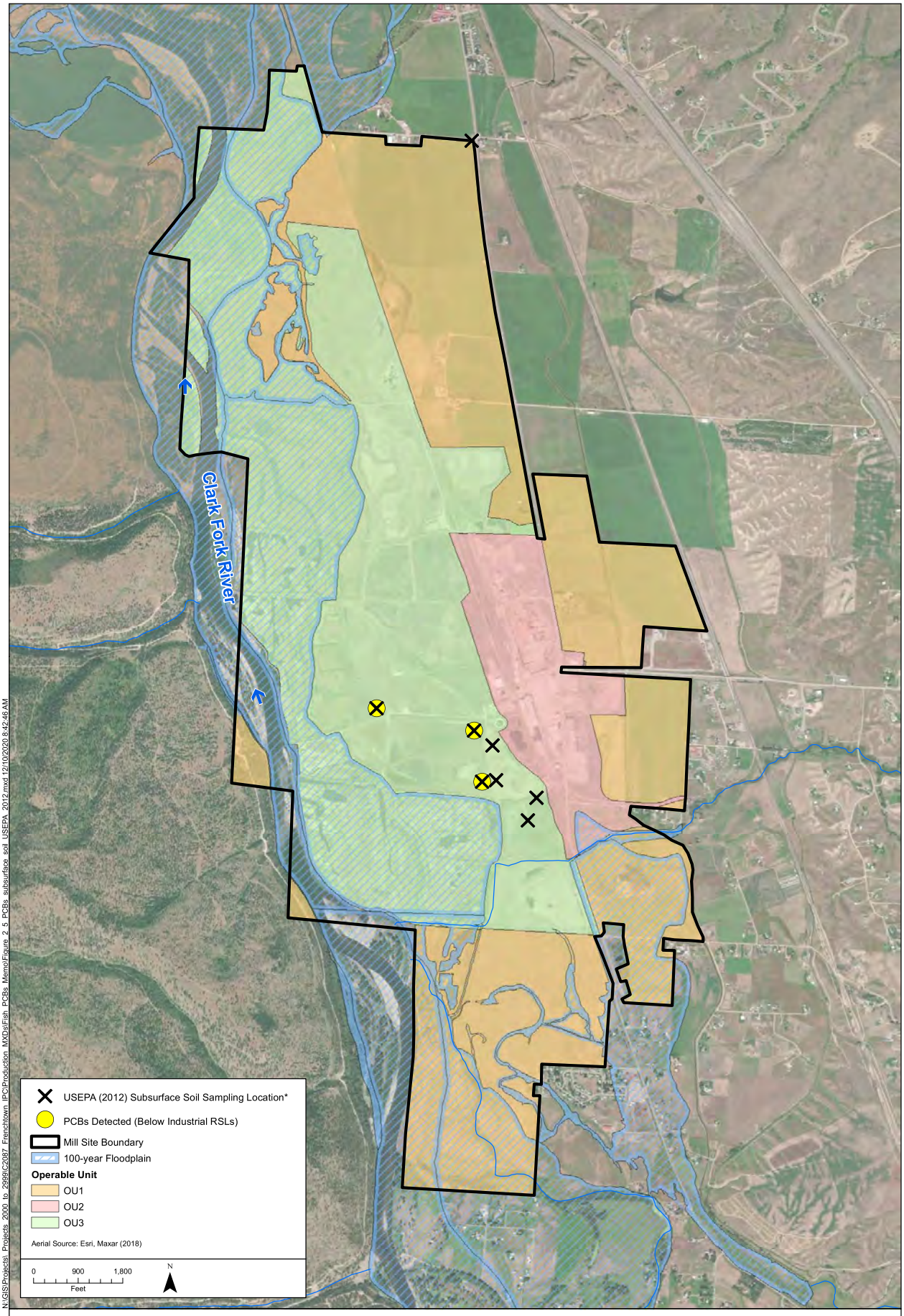
Figure 2-4.
Surface Soil Sampling Locations and PCB Concentrations from the Supplemental Soil Sampling in 2017



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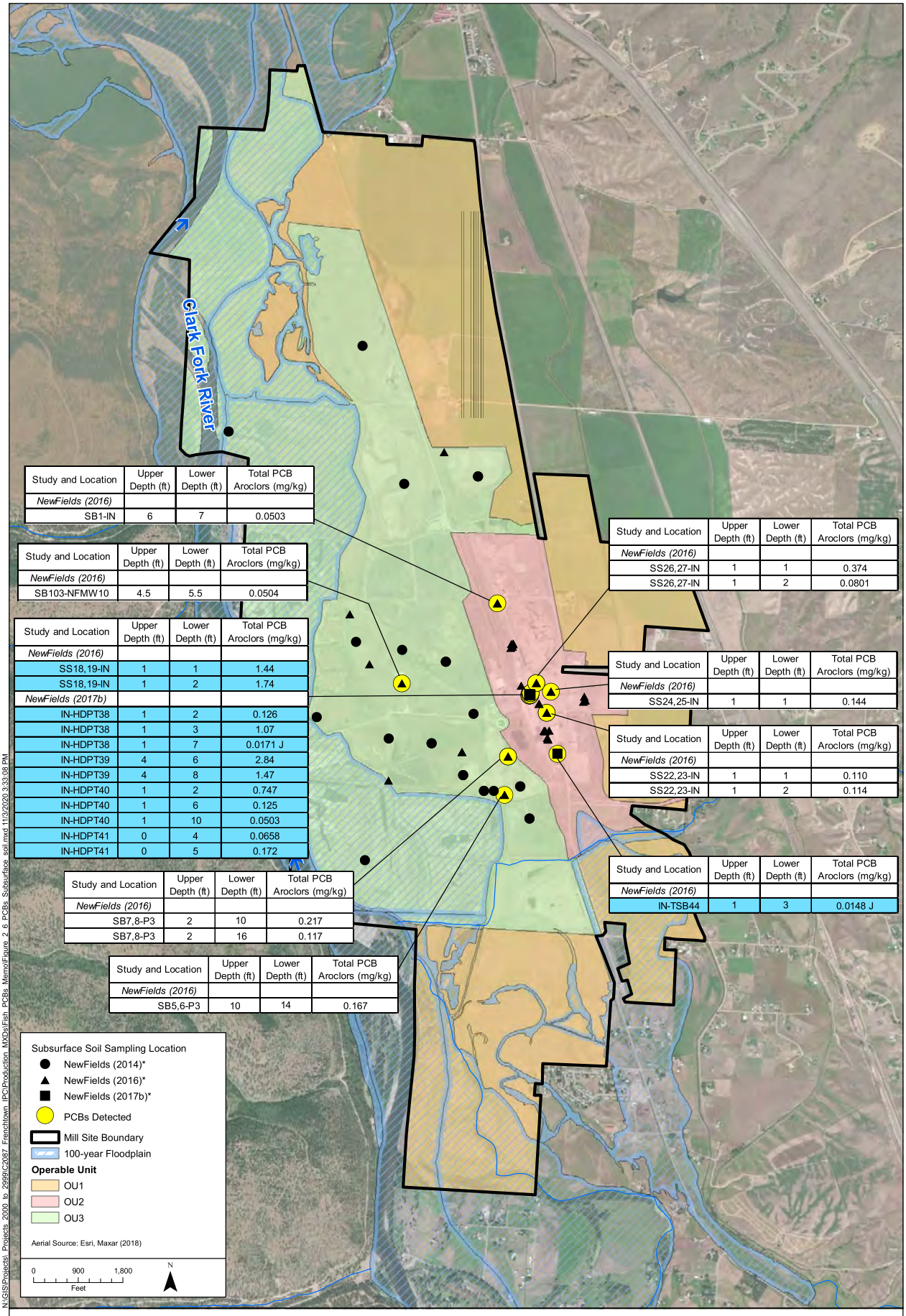
Note:
* A black symbol without a yellow highlighted symbol behind it indicates PCBs were not detected

Figure 2-5.
Locations of Subsurface Soil Samples and Aroclor Detections from USEPA (2012)



Study and Location	Upper Depth (ft)	Lower Depth (ft)	Total PCB Aroclors (mg/kg)
NewFields (2016)			
SB1-IN	6	7	0.0503

Study and Location	Upper Depth (ft)	Lower Depth (ft)	Total PCB Aroclors (mg/kg)
NewFields (2016)			
SB103-NFMW10	4.5	5.5	0.0504

Study and Location	Upper Depth (ft)	Lower Depth (ft)	Total PCB Aroclors (mg/kg)
NewFields (2016)			
SS18,19-IN	1	1	1.44
SS18,19-IN	1	2	1.74
NewFields (2017b)			
IN-HDPT38	1	2	0.126
IN-HDPT38	1	3	1.07
IN-HDPT38	1	7	0.0171 J
IN-HDPT39	4	6	2.84
IN-HDPT39	4	8	1.47
IN-HDPT40	1	2	0.747
IN-HDPT40	1	6	0.125
IN-HDPT40	1	10	0.0503
IN-HDPT41	0	4	0.0658
IN-HDPT41	0	5	0.172

Study and Location	Upper Depth (ft)	Lower Depth (ft)	Total PCB Aroclors (mg/kg)
NewFields (2016)			
SB7,8-P3	2	10	0.217
SB7,8-P3	2	16	0.117

Study and Location	Upper Depth (ft)	Lower Depth (ft)	Total PCB Aroclors (mg/kg)
NewFields (2016)			
SB5,6-P3	10	14	0.167

Study and Location	Upper Depth (ft)	Lower Depth (ft)	Total PCB Aroclors (mg/kg)
NewFields (2016)			
SS26,27-IN	1	1	0.374
SS26,27-IN	1	2	0.0801

Study and Location	Upper Depth (ft)	Lower Depth (ft)	Total PCB Aroclors (mg/kg)
NewFields (2016)			
SS24,25-IN	1	1	0.144

Study and Location	Upper Depth (ft)	Lower Depth (ft)	Total PCB Aroclors (mg/kg)
NewFields (2016)			
SS22,23-IN	1	1	0.110
SS22,23-IN	1	2	0.114

Study and Location	Upper Depth (ft)	Lower Depth (ft)	Total PCB Aroclors (mg/kg)
NewFields (2016)			
IN-TSB44	1	3	0.0148 J

Notes:
1.* A black symbol without a yellow highlighted symbol behind it indicates PCBs were not detected.
2. Sample results highlighted in blue indicate PCB concentrations addressed by 2017 soil removal action (NewFields 2018b).
3. J = estimated value

Figure 2-6.
Subsurface Soil Sampling Locations for PCB Aroclors from the Remedial Investigation, 2014-2016

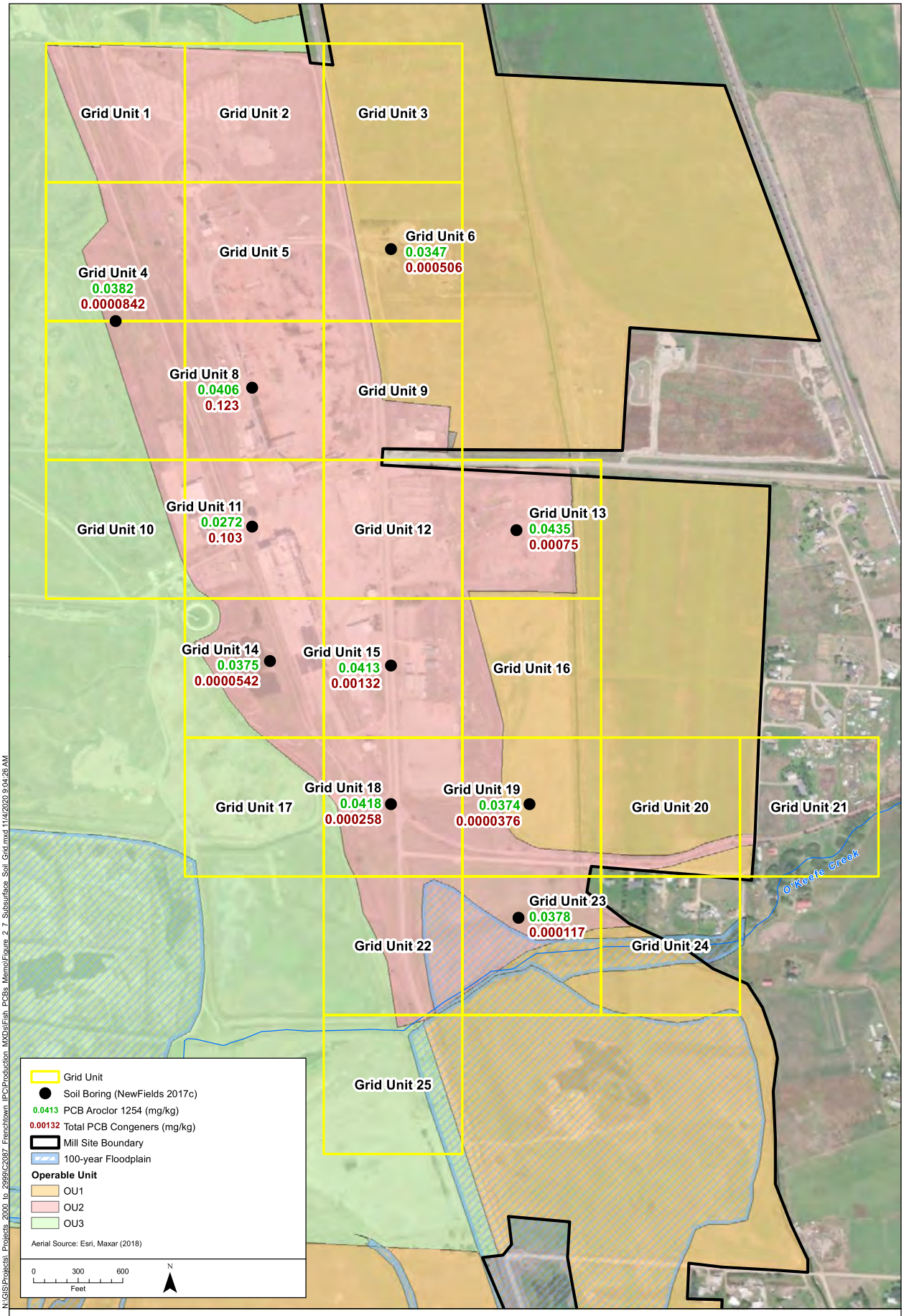


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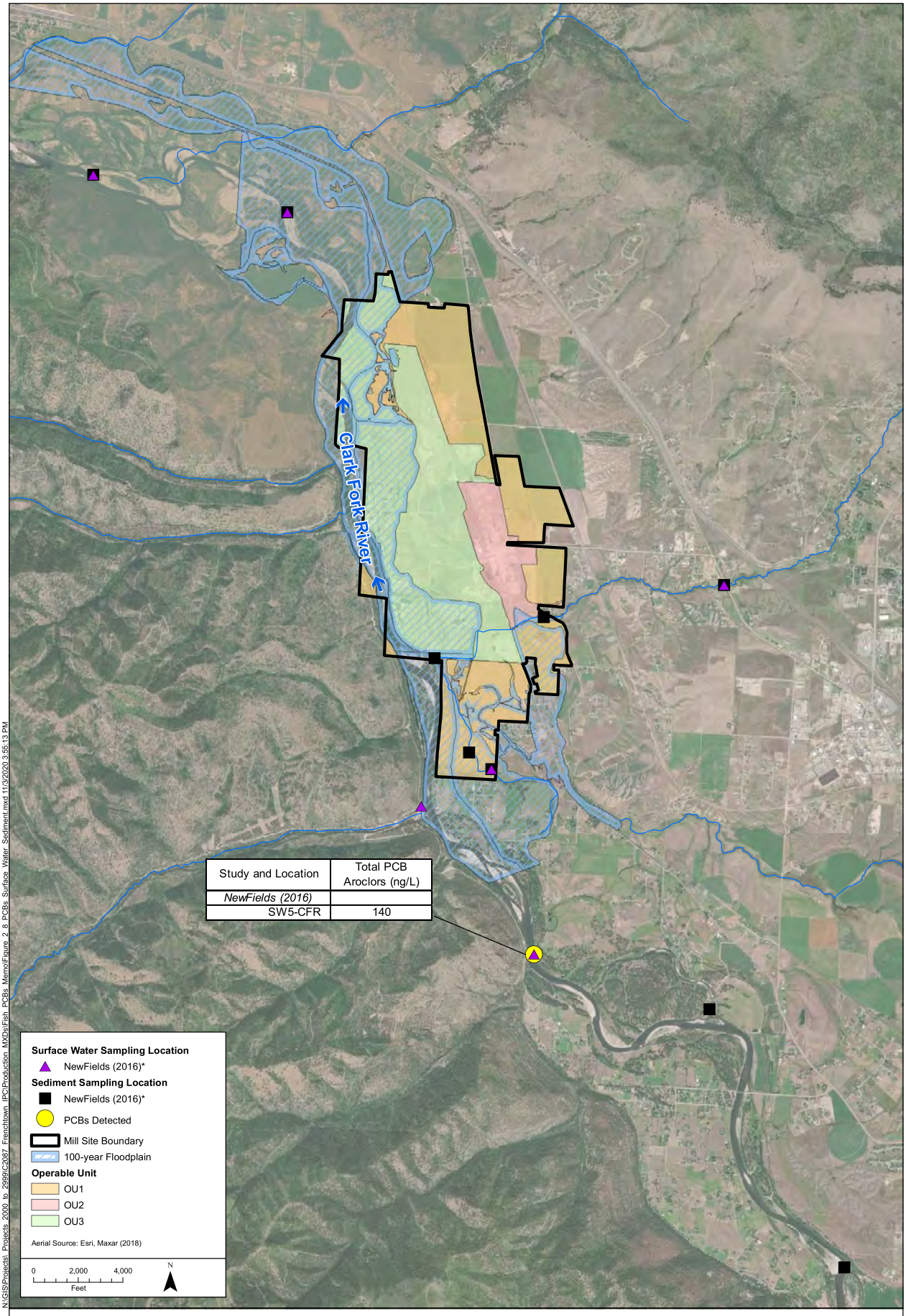
Figure 2-7.
Subsurface Soil Sampling Locations and PCB Concentrations from the Supplemental Soil Sampling in 2017



Notes:
1.* A symbol without a yellow highlighted symbol behind it indicates PCBs were not detected.
2. Total PCB Aroclors represents Aroclor 1221 only.

Figure 2-8.
Locations of Surface Water and Sediment Locations for PCB Aroclors from the Remedial Investigation, 2015

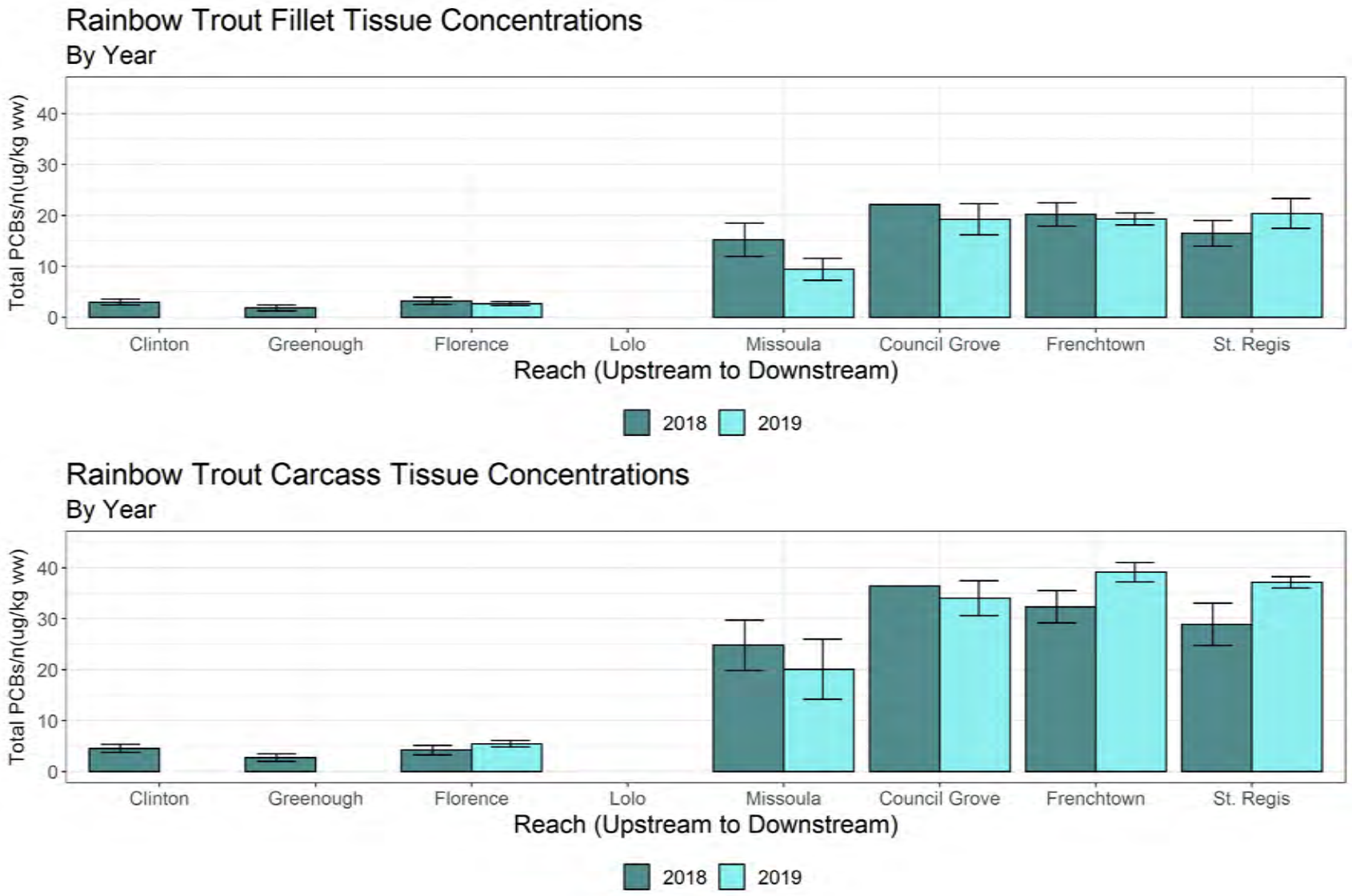
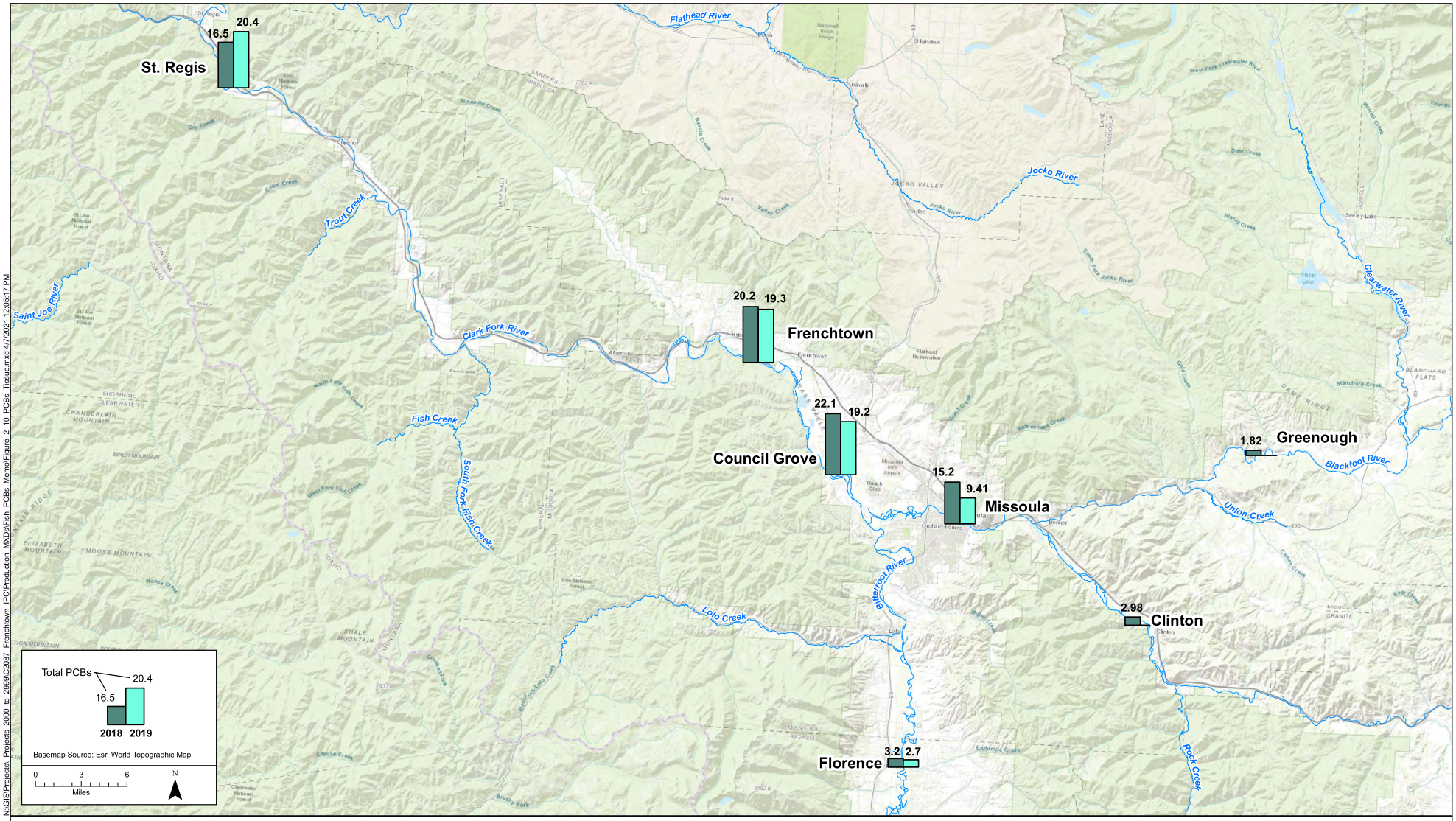
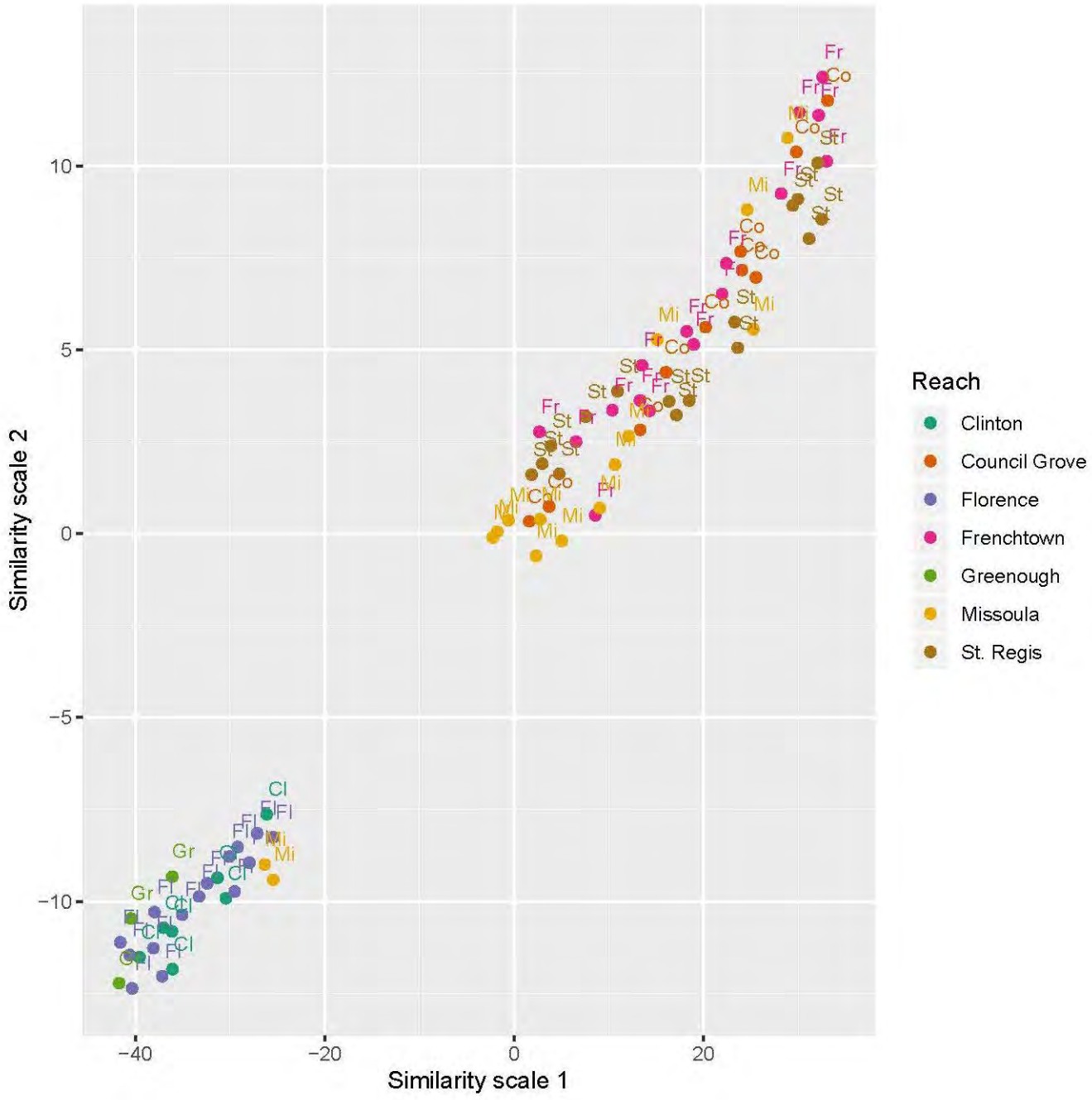


Figure 2-9.
Total PCB Concentrations in Rainbow Trout Fillet and Carcass Tissue Sampled in 2018 and 2019



Note: Average Total PCB concentrations shown in µg/kg

Figure 2-10.
Total PCB Concentrations in Rainbow Trout Fillet Tissue Sampled in 2018 and 2019



Note: Proximity of points in the figure indicates the similarity between samples based on all measured PCB congeners. Samples that are close together are more similar than samples that are far apart. The similarity scales on the axes are selected by the method to fit the range of similarity values in the data set.

Figure 2-11.
Relative Similarity of PCB Congeners in Rainbow Trout Fillet and Carcass Tissues Sampled in 2018 and 2019

Tables

Table 2-1. Summary of PCB Results for Soil, Surface Water, Groundwater, and Sediment

Site Investigation	No. of Samples Collected [a]	No. of Samples with Detected PCBs	Sample Name	Sample Location		Sample Concentrations [b, c]
				Operable Unit 2	Operable Unit 3	
USEPA (2012) Analytical Results Report for a Combined Site Inspection and Removal Assessment						
Surface Soil	17	5	SSSO1102, SSSO1202, SSSO1302, SSSO1402, SSSO1702	---	Settling Ponds 4 and Pond 8; Landfill A	0.011–0.080 (Aroclor 1254) 0.100–0.350 (Aroclor 1260)
Subsurface Soil [d]	8	3	SSSO1110, SSSO1306, SSSO0916	---	Sludge Ponds 4, 5, and Spill Pond 8	0.036–0.065 (Aroclor 1248) 0.064–0.089 (Aroclor 1254)
NewFields (2014) Site Investigation of Ancillary Parcels and Waste Water Treatment System						
Surface Soil	24	0	---	---	---	---
Subsurface Soil	22	0	---	---	---	---
Groundwater	15	1	NFMW-2	---	Downgradient of clarifier	0.31 (Aroclor 1260) 0.31 (Total PCB Aroclors)
Surface Water	0	0	---	---	---	---
Sediment	0	0	---	---	---	---
NewFields (2016) Preliminary Data Summary Report						
Surface Soil	15	10	SS18-IN-(12), SS19-IN-(24), SS22-IN-(12), SS23-IN-(24), SS24-IN-(12), SS26-IN-(12), SS27-IN-(24), SS28-IN-(0-2)c, SS29-IN-(0-2)c, SS31-IN-(0-2)c	Transformer Foundation, High Density Pulp Tank, Recovery Boiler Area	---	0.0801–0.374 (Aroclor 1254) 0.0881–7.49 (Aroclor 1260) 0.0801–7.49 (Total PCB Aroclors)
Subsurface Soil	31	5	SB1-IN-(6-7), SB103-NFMW10-(4-5.5), SB6-P3-(10-14)c, SB7-P3-(2-10)c, SB8-P3 (10-16)c	SB1-IN (Chip Plant Dump)	Settling Pond 3, Well NFMW-10	0.117–0.167 (Aroclor 1254) 0.0503–0.117 (Aroclor 1260) 0.0503–0.217 (Total PCB Aroclors)
Surface Water	6	1	SW-5 (CFR)	---	Upgradient of site (Background)	0.14 (Aroclor 1221) 0.14 (Total PCB Aroclors)
Groundwater	11	0		---	---	---
Sediment	9	0	---	---	---	---
NewFields (2017) Shallow Groundwater Sampling Event						
Groundwater	8	1	NFMW2	---	In OU3	0.12 (Aroclor 1260) 0.12 (Total PCB Aroclors)

Table 2-1. Summary of PCB Results for Soil, Surface Water, Groundwater, and Sediment

Site Investigation	No. of Samples Collected [a]	No. of Samples with Detected PCBs	Sample Name	Sample Location		Sample Concentrations [b, c]
				Operable Unit 2	Operable Unit 3	
NewFields (2017) PCB Soils Investigation Report (Operable Unit 2)						
High Density Pulp Tank (HDPT) Area						
Surface Soil	6	5	IN-HDPT38-SB1, IN-HDPT38-SB2, IN-HDPT39-SB1; IN-HDPT40-SB1, IN-HDPT40-SB2	High Density Pulp Tank Area	---	0.0429–0.747 (Aroclor 1260) 0.0429–0.747 (Total PCB Aroclors)
Subsurface Soil	8	8	IN-HDPT38-SB3; IN-HDPT38-SB4, IN-HDPT39-SB4, IN-HDPT39-SB6, IN-HDPT40-SB3, IN-HDPT40-SB4, IN-HDPT41-SB1, IN-HDPT41-SB5	High Density Pulp Tank Area	---	0.0171–2.840 (Aroclor 1260) 0.0171–2.840 (Total PCB Aroclors)
Transformer Storage Building (TSB) Area						
Surface Soil	4	3	IN-TSB44-SB1, IN-TSB46-SB1, IN-TSB47-SB1	Transformer Storage Building Area	---	0.156–0.893 (Aroclor 1254) 0.0152–0.0667 (Aroclor 1260) 0.0152–0.893 (Total PCB Aroclors)
Subsurface Soil	1	1	IN-TSB44-SB2	Transformer Storage Building Area	---	0.0148 (Aroclor 1260) 0.0148 (Total PCB Aroclors)
High Groundwater						
Groundwater	9	1	SMW17	---	---	0.087 (Aroclor 1260) 0.087 (Total PCB Aroclors)
NewFields (2018b) Data Summary Report - Supplemental Soil Sampling in Operable Units 2 and 3 to Support Risk Assessments						
Surface Soil (0-0.5 ft) [e]	9	7 (PCB Aroclors)	Grid 1-SSComp-01, Grid 2-SSComp-01, Grid 4&7-SSComp-01, Grid 8-SSComp-01, Grid 9-SSComp-01, Grid 14-SSComp-01, Grid 22-SSComp-01 (PCB Aroclors)	---	---	0.0247–0.413 (Total PCB Aroclors)
		9 (PCB Congeners)	Grid 1-SSComp-01, Grid 2-SSComp-01, Grid 4&7-SSComp-01, Grid 8-SSComp-01, Grid 9-SSComp-01, Grid 13-SSComp-01, Grid 14-SSComp-01, Grid 22-SSComp-01, Grid 23-SSComp-01 (PCB Congeners)	---	---	0.00767–1.130 (Total PCB Congeners)
Subsurface Soil (2.0-2.5 ft) [f]	10	2 (PCB Aroclors)	Grid 8-SB-(24-30in), Grid 11-SB-(24-30in) (PCB Aroclors)	---	---	0.0406–0.0882 (Total PCB Aroclors)

Table 2-1. Summary of PCB Results for Soil, Surface Water, Groundwater, and Sediment

Site Investigation	No. of Samples Collected [a]	No. of Samples with Detected PCBs	Sample Name	Sample Location		Sample Concentrations [b, c]
				Operable Unit 2	Operable Unit 3	
		10 (PCB Congeners)	Grid 4&7-SB-(24-30in), Grid 6-SB-(24-30in), Grid 8-SB-(24-30in), Grid 11-SB-(24-30in), Grid 13-SB-(24-30in), Grid 14-SB-(24-30in), Grid 15-SB-(24-30in), Grid 18-SB-(24-30in), Grid 19-SB-(24-30in), Grid 23-SB-(24-30in) (PCB Congeners)	---	---	0.0000376–0.123 (Total PCB Congeners)
Groundwater	32	4	NFMW15 (July and December 2017), NFMW2, SMW17			0.059 - 0.1 (Aroclor 1260) 0.059 - 0.1 (Total PCB Aroclors)
NewFields (2018a) Construction Completion Report - PCB-Impacted Soil in Operable Unit 2						
Subsurface Soil	15	12	TSB-W, HDPT-4-Bottom-1, HDPT-4-Bottom, TSB-S, HDPT-4-Bottom-2, TSB-N, HDPT-4-E, HDPT-4-NW, HDPT-4-SW, HDPT-4-S, HDPT-8-Bottom, HDPT-4-NE	Transformer Storage Building Area and High Density Pulp Tank Area	---	0.032–0.715 (Total PCB Aroclors)
Clean Backfill	1	0	---	---	---	---
Groundwater	18	2	NFMW15 (June and December 2018)			0.05-0.12 (Aroclor 1260) 0.05-0.12 (Total PCB Aroclors)

Notes:
--- = not applicable
PCB = polychlorinated biphenyl

[a] Does not include field duplicate samples, splits, or any other quality control samples.
[b] Soil concentrations in mg/kg, groundwater and surface water in µg/L.
[c] Total PCBs represents sum of detected PCB congeners or detected Aroclors; ND=0.
[d] One sample was collected in OU1.
[e] Surface soil samples collected in 2017 and sampled for PCBs were 20-point composite samples collected in 20-acre grids.
[f] Subsurface soil samples collected in 2017 and sampled for PCBs were discrete samples.

Table 2-2. Number of Fish Targeted and Number Actually Collected at Each Planned Sampling Location, with Final Composite[a] Counts

Targeted Fish Species	Sampled Areas: Watershed or Sub-Watershed	Sampled Areas: Sampling Reach	Number of Fish and Composites, 2018: Number of Fish Targeted	Number of Fish and Composites, 2018: Actual Number of Fish	Number of Fish and Composites, 2018: Final Numbers of Composite Samples (Fillet and Carcass), 2018	Number of Fish and Composites, 2019: Number of Fish Targeted	Number of Fish and Composites, 2019: Actual Number of Fish	Number of Fish and Composites, 2019: Final Numbers of Composite Samples (Fillet and Carcass), 2019
Rainbow Trout								
	Clark Fork River	Clinton	20	20	4	20	0	0
		Missoula	20	19	4[b]	20	20	4
		Council Grove	20	4	1[b]	20	20	4
		Frenchtown	20	20	4	20	20	4
		St. Regis	20	20	4	20	20	4
	Bitterroot River	Lolo	0	0	0	0	0	0
		Florence	20	20	4	20	20	4
	Blackfoot River	Greenough	20	8	2[c]	20	0	0
Northern Pike	Clark Fork River	Clinton	0	0	0	20	0	0
		Missoula	0	1	1[d]	20	0	0
		Council Grove	0	1	1[d]	20	1	1[d]
		Frenchtown	20	20	4	20	20	4
		St. Regis	0	0	0	20	0	0
	Bitterroot River	Lolo	20	20	4	20	20	4
		Florence	0	0	0	0	0	0
	Blackfoot River	Greenough	0	0	0	20	0	0

Source: USEPA (2018, 2019a,b, 2020a)

Notes:

[a] All composites consist of five fish, except where noted otherwise.

[b] One composite consists of tissue from four fish instead of five.

[c] One of the two composites consists of two fish; the other consists of six fish.

[d] Composite consists of tissue from one fish.

Table 3-1. Summary of Total PCB Concentrations in Fillet from Various Fish Species Collected for Washington's Fish Tissue Monitoring Programs

Location	General Location	Fish Species	Year Sampled	Total PCB Concentrations (µg/kg wet weight)	Reference
EPA Team's 2018 and 2019 Fillet Tissue					
Clark Fork River and Tributaries	Missoula (pop. 74,820)	Rainbow Trout	2018, 2019	1.23–28.9 [a]	USEPA (2020a)
		Northern Pike	2018, 2019	0.653–68.2 [a]	USEPA (2020a)
Montana					
Flathead Lake	Kalispell (pop. 20,065)	Lake Trout	Unknown	80–380 [b]	USEPA National Listing of Fish Advisories
Whitefish Lake	Whitefish (pop. 6,384)	Lake Trout	Unknown	69 [b]	USEPA National Listing of Fish Advisories
Washington					
McIntosh Lake	Thurston County (pop. 252,947)	Brown trout	2001	13.1 [a]	Ecology (2003)
Liberty Lake	Spokane (pop. 209,523)	Brown trout	2001	39 [a]	Ecology (2003)
Samish Lake	Bellingham (pop. 80,885)	Cutthroat trout	2001	13.1 [a]	Ecology (2003)
Lake Whatcom	Bellingham (pop. 80,885)	Cutthroat trout	2001	18.3 [a]	Ecology (2003)
Lake Padden	Bellingham (pop. 80,885)	Cutthroat trout	2001	10.8 [a]	Ecology (2003)
Spokane River	Plante Ferry Reach (Spokane Valley, WA pop. 89,755)	Rainbow Trout	2005	55 [a]	Ecology (2011); Serdar and Johnson (2006)
Chehalis River	Chehalis (pop. 7259)	Mountain Whitefish	1993	143 [b]	Ecology (1995)

Table 3-1. Summary of Total PCB Concentrations in Fillet from Various Fish Species Collected for Washington's Fish Tissue Monitoring Programs

Location	General Location	Fish Species	Year Sampled	Total PCB Concentrations (µg/kg wet weight)	Reference
Lake Chelan	Chelan (pop. 3,888)	Rainbow Trout	1992	15 [a]	Ecology (1995); Davis and Johnson (1994)
Lake Chelan	Chelan (pop. 3,888)	Sockeye Salmon	1992	12 [a]	Ecology (1995); Davis and Johnson (1994)
Crab Creek	Royal City (pop: 2140)	Mountain Whitefish	1992	30 [a]	Ecology (1995); Davis and Johnson (1994)
Mercer Slough	Bellevue City (pop: 122363)	Rainbow Trout	1992	51 [a]	Ecology (1995); Davis and Johnson (1994)
Cowlitz River near Vader	Dispersed population	Cutthroat Trout	1995, 2005	55–84 [a]	Ecology (2019)
		Mountain Whitefish	1995, 2005	46–60 [a]	Ecology (2019)
		Cutthroat Trout, Largemouth Bass, Mountain Whitefish, Northern Pikeminnow, Rainbow Trout	2016	1.9–53.8 [a,c]	Ecology (2019)

Source: Integral (2007)

Notes:

Population data are based on the 2010 U.S. Census.

[a] Total PCBs represents sum of detected PCB congeners or detected Aroclors; ND=0.

[b] Total PCBs represents sum of detected PCB congeners or detected Aroclors; unknown how compounds that were not detected were treated.

[c] A range of detections in listed because the source document (Ecology 2019) does not list individual sample data; non-salmonid fish species included for the same reason.

Technical Memorandum

Smurfit-Stone/Frenchtown Mill Site, Missoula County, Montana

Date:	October 15, 2021	**EPA Site ID:**	MTN000802850
To:	Allie Archer (EPA), Keith Large (MDEQ)	**Docket No:**	CERCLA-08-2016-0001
From:	David Tooke, Chris Cerquone (NewFields)		

Subject: Adequacy of Remedial Investigation Surface Water and Groundwater Data
Attachments: Figure 1: Surface Water Sampling Completed During the Remedial Investigation

This technical memorandum summarizes the adequacy of surface water and groundwater data collected during the Remedial Investigation (RI) at the Former Smurfit-Stone/Frenchtown Mill Site (site) as it relates to a Surface Water-Groundwater Interaction Study (Study – MVWQD, 2020) completed by the Missoula City-County Health Department. The Study purportedly identified potential gaining reaches of the CFR, where shallow groundwater from the site may be entering the Clark Fork River (CFR). Potential gaining reaches were identified based on temperature differentials measured using fiber optic cables placed along the bed of the CFR.

The MVWQD Study, as provided to NewFields, has inherent use limitations due to the following factors that were not considered during the identification of potential gaining reaches:

- CFR channel morphology, sensor depth, and river current velocity were not included in the Study.
- Solar radiation or other meteorological data were not included in the Study.
- Site specific groundwater and surface water temperature data were not included in the Study; and
- Locations of exposed, or “daylighted”, groundwater in former holding ponds at the site were not considered or included in the Study.
- The MVWQD Study was not developed or performed in a manner where any public, private, or stakeholder input was solicited during either the work planning, data collection, or reporting process. The MVWQD Study relies solely on a single line of evidence, does not include any published quality assurance/quality control data, and does not include or consider the quantity and variety of available data collected at the site since post-closure environmental investigations began in 2012.

Despite the limitations of the MVWQD Study, the authors concluded that additional sampling should be conducted to investigate specific potential gaining reaches of the CFR. This technical memorandum

outlines that sufficient analytical data have been collected as part of the RI and that additional surface water or groundwater data are not needed.

A primary objective of the RI is to evaluate the nature and extent of potential contributions of contaminants of potential concern (COPCs) from the site to the CFR. Available groundwater and surface water RI data meet this objective for the following reasons:

1) Previous investigations (**Figure 1**) are sufficient to characterize current groundwater quality and surface water quality of the CFR. The CFR has been sampled 31 times along the site's boundary. RI constituents of interest include dioxins/furans, polychlorinated biphenyls (PCBs), metals, cations and anions, and general water quality parameters. RI groundwater data show there are no point sources of contamination in Operable Unit 3 of the site but permitted wastewater and discharges in the former wastewater treatment system has influenced shallow groundwater on the site. To address the potential for groundwater to impact the river, numerous shallow and deep monitoring wells are located downgradient of the former wastewater system and along the length of the CFR boundary.

   Shallow groundwater sample locations downgradient of the wastewater system and distributed along the length of the site have adequately evaluated potential impacts to the CFR. Groundwater monitoring wells located within or near all of these zones (with the exception of the zone near Pond 13A) (**Figure 1**) have and continue to provide representative data regarding the chemistry of discharging groundwater.

2) Previous groundwater and CFR investigations have sufficiently evaluated the potential extent of COPCs present in groundwater discharge to the CFR. The CFR's hyporheic zone (groundwater-surface water interface) likely attenuates certain constituents. Groundwater sampling shows that dioxins, arsenic, manganese, and iron are the primary COPCs in shallow groundwater at the site. PCBs, VOCs, SVOCs and other metals are not present in shallow groundwater at the site in concentrations above risk-based standards or background levels (EPA 2020a, 2020b, 2020c).

   Table 1 shows the average concentrations of COPCs observed on site in groundwater from nine monitoring wells adjacent to the CFR (**Figure 1**). Toxicity equivalence (TEQ) for dioxins is calculated in two ways using different values for individual dioxin/furan congeners that are not detected. The average value of 1.95 parts per quadrillion (ppq) TEQ dioxins is calculated using half of the laboratory reporting limit (1/2 DL) for dioxin/furan congeners, and the average concentration of 0.23 ppq TEQ dioxins (0 DL) is calculated using 0 ppq for dioxin/furan congeners.

   As shown on the table, average concentrations for dioxins (both 1/2 DL and 0 DL) are below the EPA's primary Maximum Contaminant Level (drinking water standard) in groundwater of 30 ppq and the Montana Department of Environmental Quality (DEQ) ambient groundwater standard of 2.0 ppq. Therefore, no additional TEQ dioxin groundwater data collection is necessary to evaluate potential impacts to the river from discharge of shallow groundwater to the river.

   The average arsenic concentration in the same wells is approximately 18 µg/L (**Table 1**), which is above the DEQ ambient groundwater quality standard and EPA MCL of 10 µg/L, but below the

DEQ acute and chronic aquatic life standards of 340 µg/L and 150 µg/L, respectively. Arsenic is present in the groundwater primarily because it is a component of the parent aquifer material (i.e., there is no site-generated source of arsenic), and it decreases in concentration as dissolved oxygen increases in the hyporheic zone along the CFR boundary. Arsenic leaching from the parent aquifer material may migrate in groundwater under anoxic (low oxygen) conditions; however, as anoxic groundwater mixes with the more oxygenated surface water adjacent to the CFR, arsenic sorbs to solid aquifer matrices and/or precipitates out of solution. These attenuation reactions result in surface water concentrations in the CFR that are lower than the adjacent groundwater (dissolved and total) concentrations.

Table 1: Average Concentration of Select COPCs in Nine Shallow GW Wells Adjacent to CFR

Analyte	Sample Number	Number of Non-Detects (ND)	Average GW Concentration (where ND=RL)	GW Quality Criteria	Acute ALS (SW) [3]	Chronic ALS (SW) [3]
Arsenic (total)	66	2	17.9	---	340	150
Arsenic (dissolved)	79	1	18.4	10 [1]	---	---
Iron (total)	66	1	2,924	---	---	1000
Iron (dissolved)	79	3	2,347	*300* [2]	---	---
Manganese (total)	66	0	3,057	---	---	---
Manganese (dissolved)	79	0	3,072	*50* [2]	---	---
TEQ Dioxins (0 DL)	67	4	0.23	2 [1]	---	---
TEQ Dioxins (1/2 DL)	67	4	1.95	2 [1]	---	---

Notes:

All concentrations are in parts per billion (µg/L or ppb), except for toxicity equivalence (TEQ) dioxins.

TEQ dioxin concentrations are in parts per quadrillion (pg/L or ppq)

RL = Reporting Limit; GW = groundwater; SW = surface water; ND = not detected; ALS = aquatic life standard

[1] Arsenic and TEQ standards are Circular DEQ-7 Montana Numeric Water Quality Standards for groundwater.

[2] Iron and manganese criteria are EPA secondary maximum contaminant levels (MCLs) shown in *italics*.

[3] Circular DEQ-7 Montana Numeric Water Quality Standards for Aquatic Life (surface water) (MDEQ 2019).

Manganese is detected in the nine CFR-adjacent wells at an average concentration of approximately 3,000 µg/L and iron is present at approximately 2,300 to 2,900 µg/L. By comparison, the EPA secondary MCL is 50 µg/L for manganese and 300 µg/L for iron. There are no DEQ ambient groundwater or acute and chronic aquatic life standards for manganese, and similarly there are no DEQ ambient groundwater or acute aquatic life standards for iron. There is a chronic DEQ aquatic life standard for iron of 1,000 µg/L. Manganese is similar to arsenic in that it is present in the parent aquifer material, is released into solution under anoxic conditions, and sorbs/precipitates out of solution under more oxygenated conditions. The occurrence of attenuation reactions within the hyporheic zone is supported by the large decrease in groundwater concentrations (**Table 1**) compared to the concentrations observed in the CFR adjacent to (or below) the site (**Table 2**).

As shown in **Table 2**, below, there is no definable change in water quality of the CFR as it flows past the site, except for manganese. The upstream total manganese average concentration is 20.3

µg/L, compared to 43.1 and 52.7 µg/L adjacent and downstream, respectively. However, in contrast, average TEQ concentrations (1/2 DL) of CFR samples do not increase from upstream to downstream. In fact, all 17 congeners were measured below detection limits in 16 of the 17 samples collected adjacent to and downstream of the site. By comparison, all 17 congeners were measured above detection limits in 7 of the 10 surface water samples collected above the site (i.e., upstream). The higher frequency of congener detections upstream of the site is associated with background sources (not site-related) of dioxins/furans to the CFR. It is also important to note that TEQ dioxin concentrations (1/2 DL) for surface water sample locations adjacent to and downstream from the site are overestimated because they are predominantly associated with the use of laboratory reporting limits in the TEQ calculation and do not accurately represent or quantify the actual dioxin/furan concentration.

3) The site is not degrading surface water quality of the CFR. Degradation is defined in Montana State Law (75-5-103 MCA) as a change in water quality that lowers the quality of high-quality waters for a given parameter. The CFR is a high-quality water based on the State definition (75-5-103 MCA). Data collected shows the CFR's quality above, adjacent, and downstream of the site meets all beneficial uses as defined in State law including drinking, culinary, and food processing after conventional treatment; bathing, swimming, recreation; growth and propagation of fish and associated aquatic life, waterfowl, furbearers; and agriculture and industrial water supply (without need for additional treatment). Manganese may be present in the CFR below the site at a concentration slightly above the EPA Secondary Maximum Contaminant Level (SMCL) of 50 µg/L based on taste and odor, but through conventional treatment the manganese concentration can be lowered to below this SMCL.

4) EPA concluded that sufficient data have been collected to evaluate any potential risks to human health or the ecosystem from the site. These conclusions were made in the Final 2021 Baseline Ecological Risk Assessment (BERA; EPA 2021) and Draft Human Health Risk Assessments (HHRAs; EPA 2020b, 2020c). Risk assessment results do not indicate there is an unacceptable risk from the site to humans using the CFR, or to the ecosystem (EPA 2021, 2020c). Also, EPA did not require or recommend additional sampling to address uncertainty discussed in the Risk Assessments.

Table 2: Average Concentration of Select COPCs in Clark Fork CFR

Analyte	Number of Results	Number of Non-detects	Average Concentration[1] (ND=RL)[2]	Human Health Standard (SW)	Acute Aquatic Life Standard (SW)	Chronic Aquatic Life Standard (SW)
Upstream of Site						
Arsenic (total)	10	0	2.7	10	340	150
Arsenic (dissolved)	10	0	2.6	10	---	---
Iron (total)	10	1	48.6	---	---	1000
Iron (dissolved)	10	6	10.6	---	---	---
Manganese (total)	10	0	20.3	---	---	---
Manganese (dissolved)	10	0	12.3	---	---	---
TEQ Dioxins (0DL)	10	3	0.0029	0.05	---	---
TEQ Dioxins (1/2 DL)	10	3	1.21	0.05	---	---
Adjacent to Site						
Arsenic (total)	5	0	2.9	10	340	150
Arsenic (dissolved)	5	0	2.9	10	---	---
Iron (total)	5	0	79.4	---	---	1000
Iron (dissolved)	5	0	96.4	---	---	---
Manganese (total)	5	0	43.1	---	---	---
Manganese (dissolved)	4	0	19.4	---	---	---
TEQ Dioxins (0DL)	5	4	0.0003	0.05	---	---
TEQ Dioxins (1/2 DL)	5	4	1.21	0.05	---	---
Downstream of Site						
Arsenic (total)	12	0	3.1	10	340	150
Arsenic (dissolved)	12	0	2.9	10	---	---
Iron (total)	12	0	68.9	---	---	1000
Iron (dissolved)	12	2	19.1	---	---	---
Manganese (total)	12	0	57.2	---	---	---
Manganese (dissolved)	12	10	76.5	---	---	---
TEQ Dioxins (0 DL)	12	10	0.0004	0.05	---	---
TEQ Dioxins (1/2 DL)	12	10	1.52	0.05	---	---

Notes: SW = surface water; TEQ = toxicity equivalence; ½ DL or 0 DL = half the detection limit or 0 substituted for individual congener concentrations for congeners that were not detected above lab reporting limits.

[1] All concentrations are parts per billion (ppb) or micrograms per liter (µg/L), except for TEQ dioxins. TEQ dioxin concentrations are in parts per quadrillion (ppq) or picograms per liter (pg/L).

[2] Constituents that were not detected (ND) are presented using the laboratory reporting limit (RL).

[3] Circular DEQ-7 Montana Numeric Water Quality Standards (MDEQ 2019).

In summary, the groundwater and surface water sampling that has been completed is sufficient to complete the RI and to evaluate potential impacts to the CFR. No additional sampling of the CFR or groundwater is necessary to evaluate the potential impacts to the CFR based on the recent study completed by the Missoula Valley Water Quality District and Missoula Public Health City-County Health Department. Surface water data collected shows that 1) the quality of CFR is not degraded (as defined by State law) by the site, and 2) the quality of the CFR meets all beneficial uses above, adjacent, and downstream of the site.

References:

75-5-103 MCA (2019). Title 75 Environmental Protection, Chapter 5 Water Quality, Part 1 General Provisions.

Environmental Protection Agency (EPA). 2021. Final Baseline Ecological Risk Assessment (BERA) for Operable Units 2 & 3 of the Smurfit-Stone/Frenchtown Mill Site Located in Missoula County, Montana. U.S. Environmental Protection Agency. October.

EPA 2020a. Draft Baseline Ecological Risk Assessment for Operable Units 2 & 3 of the Smurfit-Stone/Frenchtown Mill Site Located in Missoula County, Montana, November.

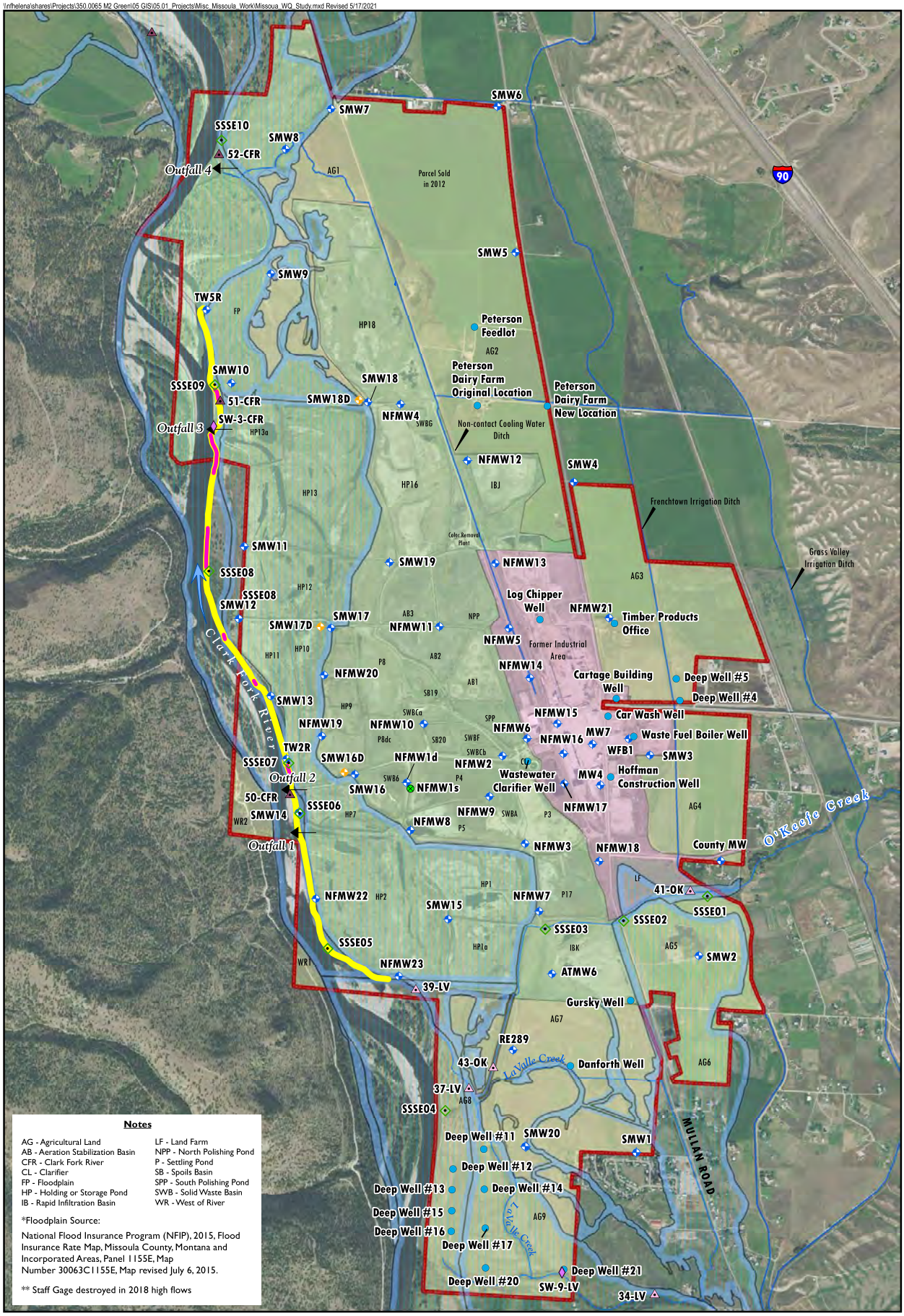
EPA 2020b. Draft Human Health Risk Assessment for the Smurfit-Stone/Frenchtown Mill Operable Unit 2 Site Located in Missoula County, Montana, December.

EPA 2020c. Draft Human Health Risk Assessment for the Smurfit-Stone/Frenchtown Mill Operable Unit 3 Site Located in Missoula County, Montana, December.

Missoula Valley Water Quality District (MVWQD) and Missoula Public Health City-County Health Department, 2020. Surface Water-Groundwater Interaction Study at Smurfit Stone, Frenchtown, MT. Power Point Presentation. March 5.

Attachments

\\nthelena\shares\Projects\350.0065 M2 Green\05 GIS\05.01_Projects\Misc_Missoula_Work\Missoua_WQ_Study.mxd Revised 5/17/2021



Notes

AG - Agricultural Land	LF - Land Farm
AB - Aeration Stabilization Basin	NPP - North Polishing Pond
CFR - Clark Fork River	P - Settling Pond
CL - Clarifier	SB - Spoils Basin
FP - Floodplain	SPP - South Polishing Pond
HP - Holding or Storage Pond	SWB - Solid Waste Basin
IB - Rapid Infiltration Basin	WR - West of River

*Floodplain Source:

National Flood Insurance Program (NFIP), 2015, Flood Insurance Rate Map, Missoula County, Montana and Incorporated Areas, Panel 1155E, Map Number 30063C1155E, Map revised July 6, 2015.

** Staff Gage destroyed in 2018 high flows

0 Feet 1,600

NewFields

Operational Units

- OU1 - Agricultural Lands
- OU2 - Industrial Area
- OU3 - Wastewater Treatment and Storage Areas
- Mill Site Boundary
- 100-Year Floodplain*
- Fiber Optic Cable
- Detected Recharge Zones
- Outfalls
- EPA Surface Water Sample Locaitons (2011)
- 2015 Surface Water Sample Location
- 2018 River Surface Water Sample Location
- 2018 Creek Surface Water Sample Location
- Water Supply Wells
- Unit 1 Monitoring Well
- Unit 3 Monitoring Well
- Perched Groundwater Monitoring Well

Surface Water Quality Monitoring Locations
Former Smurfit-Stone/ Frenchtown Mill Site
Missoula County, Montana
FIGURE 1

HELLGATE HUNTERS & ANGLERS

P.O. BOX 7792 MISSOULA, MT 59807 (406) 241-3121
www.hellgatehuntersandanglers.org

November 24, 2021

Smurfit Assessment Plan Comments
Attn: Mr. Brian Bartkowiak
Montana Natural Resource Damage Program
PO Box 201425
Helena, MT 59620-1425
NRDP@mt.gov

Re: Comments in Support of NRDP's Smurfit Stone/Frenchtown Mill Site Assessment Plan.
Dear Natural Resource Damage Program,

Hellgate Hunters & Anglers (HHA) is a local, all volunteer rod and gun club based in Missoula. We represent over 400 local hunters and anglers and appreciate the opportunity to provide input on NRDP's Assessment Plan for the former Smurfit Stone Mill Site. Our members routinely wade, float, hunt and fish the Clark Fork River both upstream and downstream of the Smurfit-Stone site near Missoula. We have a vested interest in protecting the publicly-owned natural resources and wildlife in this area. As such, HHA would like to express our full support for NRDP's assessment plan to fully evaluate the site's impacts to our local environment, including the fishery in the Clark Fork.

Local sportsmen and women have long been engaged in issues related to Smurfit Stone, primarily due to the site's history of negative impacts to the Clark Fork and its fishery. In fact, less than a year after the mill opened in 1957, wastewater releases from the Site into the Clark Fork killed all fish in the river for more than 25 miles downstream. Local sportsmen were outraged, but thanks to the dogged efforts of anglers, conservationists and other local stakeholders, the mill's wastewater operations gradually improved over time.

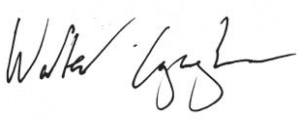
Nonetheless, after the mill closed in 2010, it became apparent that site's 60+ years of waste disposal on the floodplain, banks and waters of the Clark Fork had taken a serious toll. In 2013, 2018 and 2019, Montana FWP collected trout and pike samples from the Clark Fork stretch below the mill and found elevated levels of dioxins, furans and PCBs: all dangerous toxins and all associated with pulp and paper mill industry. FWP's discovery prompted a do-not-eat advisory for northern pike and rainbow trout that now stretches from the Bitterroot/Clark Fork confluence all the way to the Flathead River. Yet, the EPA continues to downplay or ignore the connection between the site's buried wastes and the Clark Fork River fishery and has resisted calls for more data collection. This is unacceptable.

Through NRDP's assessment plan, the Trustees have formulated a plan to use existing and newly collected data to fill information gaps and adequately characterize injuries to public-owned water resources and wildlife. HHA supports NRDP's plans to conduct additional investigations and data collection (including additional fish tissue sampling) to better assess exposure pathways between contamination at the site and fish and other wildlife such as osprey.

In short, local anglers deserve to know if they can ever trust to eat the fish in the Clark Fork. Moreover, we deserve to know how the Smurfit site is or is not contributing to the problem. Now is the time for a thorough investigation of the site's impacts on fish, wildlife and other aquatic life. If the evidence shows that the site's buried wastes are leaching into the river, then those wastes should be immediately removed.

Thank you for the opportunity to comment and for your efforts to protect and restore valuable fish and wildlife resources in the Clark Fork River.

Sincerely,



Walker Conyngham
President
Hellgate Hunters & Anglers

Gavin, Sonia

From: Watson, Vicki <vicki.watson@mso.umt.edu>
Sent: Friday, November 26, 2021 12:27 PM
To: Natural Resource Damage Program
Subject: [EXTERNAL] Smurfit Assessment Plan Comments

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Smurfit Assess Comment

Comments on NRDP assessment plan for Smurfit-Stone/Frenchtown Mill Site.

I thank the Montana NRDP for moving ahead with an assessment plan to guide restoration actions at the Smurfit-Stone/Frenchtown Mill Site. NRDP's proposed additional data gathering will greatly improve the picture we have of the current impacts to the area. It is appropriate for NRDP to coordinate these efforts with EPA's remedial investigation and feasibility study work. However, I want to restate a point that has been made to EPA and those working on EPA's RI/FS.

The Smurfit-Stone/Frenchtown Mill Site should be divided into two areas that differ greatly in the time sensitivity of the threat they pose to the surrounding area: 1) the part of the site in the historic floodplain and meander zone of the river and 2) the rest of the site.

The part in the historic floodplain/meander zone poses an imminent threat to downstream environments because larger and larger floods are expected as a result of climate change. Hence we should move forward as quickly as possible with cleanup and restoration of this area. It should not have to wait for the study and cleanup of the rest of the site – which is not as time sensitive in its threat to the surrounding area. I urge NRDP to urge the EPA to make this distinction so that remediation & restoration studies and actions of the historic floodplain & meander zone can move forward quickly before a dike failure creates a much wider zone of contamination.

I will also point out that rapid cleanup and restoration of the floodplain at this site fits all the criteria for high priority restoration alternatives listed in table 5.5 of NRDP's assessment plan .

To name just a few -- rapid floodplain cleanup/restoration complies with relevant regulations, protects public health, and is feasible.
And is certainly more cost-effective than starting cleanup after a dike failure.
And to an outstanding degree – rapid floodplain cleanup/restoration minimizes collateral damage (reducing mobility of toxins that would move downstream with a flood), restores high priority habitat & the services it provides, generates many collateral & long term benefits, and is consistent with regional planning.
And it produces these benefits sooner than any natural recovery could – in fact natural recovery would be the river reclaiming that floodplain – which we certainly do not want to happen until the toxins are cleaned up. If we move too slowly on clean-up of the historic floodplain, we may lose the opportunity for a really effective restoration of this area after a dike failure.

Hence I will again urge all those working to remediate and restore this site to do the following:
- treat the floodplain/meander zone differently from the rest of the site;
- speed up the process of remediation & restoration here in this high priority area with its time sensitive threats;
- separate this process from the slower effort that can proceed for the rest of the site.

I would also like to echo the thoughtful technical comments provided by the Clark Fork Coalition.

Thank you for considering these comments.

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Dr. Vicki Watson, Professor Emeritus of Environmental Studies
University of Montana, Missoula, MT, 59812
vicki.watson@umontana.edu 406-243-5153

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2021/11/22 9:38:07 AM MST	Jeffrey	Smith	yswolfhow	Polson, Mo
2021/11/22 1:30:38 PM MST	Kenneth	Platt	kbplatt@ia	Ames, Iowa
2021/11/22 1:52:47 PM MST	Bridgar	Hill	Bridgarloga	Livingston,
2021/11/25 9:27:54 AM MST	Alec	Underwood	aundie_rur	Missoula, M

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Missoula County Commissioners

Mailing Address: 200 West Broadway
Physical Address: 199 West Pine
Missoula, MT 59802-4292

P: 406.258.4877 | F: 406.258.3943
E: bcc@missoulacounty.us

BCC 2021-227
Nov. 23, 2021

Smurfit Assessment Plan Comments
Attn: Mr. Brian Bartkowiak
Montana Natural Resource Damage Program
PO Box 201425
Helena, MT 59620-1425

RE: Natural Resource Damage Program Assessment Plan

Dear Mr. Bartkowiak,

We support the proposed Natural Resource Damage Program Assessment Plan for the Smurfit-Stone Mill Site. The Board has expressed concern over the site since its closure in 2010. The County has closely followed the Environmental Protection Agency's risk-based process toward remediation and participated throughout this process. We remain concerned that the current site characterization minimizes site impacts. Current mischaracterization will limit redevelopment and reduce the benefits of natural resources. The Natural Resource Damage Program identifies additional pathways for contamination and identifies ways to further identify offsite contamination. The Natural Resource Damage Program Assessment Plan is an important step toward improved characterization and a necessary step for community acceptance.

Sincerely,
BOARD OF COUNTY COMMISSIONERS

David Strohmaier

David Strohmaier, Chair

Not available for signature

Josh Slotnick, Commissioner

Juanita Vero

Juanita Vero, Commissioner

BCC/VP

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Tuesday, November 30, 2021 8:25 AM
To: Natural Resource Damage Program
Subject: FW: Smurfit Stone - Rehab

Categories: Smurfit Assess Comment

From: John <jkbeighle@hotmail.com>
Sent: Friday, November 26, 2021 5:28 PM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Stone - Rehab

Hi Brian,

John Beighle native from Deerlodge. It seems that if we are cleaning up the upper ClarkFork from the headwaters to the west then the Smurfit Stone area should be cleaned up to the same extent.

There is nothing out there preventing groundwater seepage into the ClarkFork other than gravel enablement built 50 years ago.

Rivers provide numerous resources to a community and MT is known for its clean and scenic state.

I appreciate your effort in designating this an EPA clean-up site.

Thanks,

Dr. John Beighle
406-240-4593

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Tuesday, November 30, 2021 8:25 AM
To: Natural Resource Damage Program
Subject: FW: [EXTERNAL] Smurfit Site Study

Categories: Smurfit Assess Comment

From: Eli <emolloy85@gmail.com>
Sent: Friday, November 26, 2021 10:03 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit Site Study

Mr. Bratkowiak,

Please support Montana's Natural Resource Damage Program proposed study to quantify the problem and to determine the cost of the damage at the Smurfit site to the Clark Fork River.

Happy Thanksgiving,
Eli Molloy

Gavin, Sonia

From: Bartkowiak, Brian
Sent: Tuesday, November 30, 2021 8:25 AM
To: Natural Resource Damage Program
Subject: FW: [EXTERNAL] Smurfit

Categories: Smurfit Assess Comment

From: Dennis Terrazone <terrazone@sbcglobal.net>
Sent: Thursday, November 25, 2021 9:40 AM
To: Bartkowiak, Brian <Brian.Bartkowiak@mt.gov>
Subject: [EXTERNAL] Smurfit

I am sending this in support of the Montana's Natural Resource Damage Program proposal to study to quantify the problem and to determine the cost of

Sent from my iPhone