

RMP Emerging Contaminant Work Group Meeting
October 17th, 2008
San Francisco Estuary Institute
DRAFT Meeting Minutes

In Attendance:

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|---|---------------------------------|
| Eric Dunlavy (City of San Jose) | Mike Connor (SFEI) |
| Naomi Feger (SFBRWQCB) | Jay Davis (SFEI) |
| Lee Ferguson (University of South Carolina) | Susan Klosterhaus (SFEI) |
| Jennifer Field (Oregon State University) | Meg Sedlak (SFEI) |
| Bruce LaBelle (DTSC) | Don Yee (SFEI) |
| Karin North (City of Palo Alto) | |
| Kim Hooper (DTSC) | |
| June-Soo Park (DTSC) | |
| Paul Salop (AMS) | |
| David Sedlak (UC Berkeley) | Via phone: |
| Saskia van Bergen (EBMUD) | Luisa Valiela (US EPA) |
| Abdou Mekelou (CDFG) | Richard Grace (AXYS Analytical) |
| Dave Crane (CDFG) | |
| Trish Mulvey (SFEI Board Member) | |
| Kelly Moran (TDC Environmental) | |

A. Introductions, Goals, and Review of Agenda

Meg Sedlak began with introductions and a review of the day's agenda. She began with an overview of the meeting goals: feedback on 2008 pilot and special studies, input on 2009 pilot and special studies, input on current and future pesticides for the RMP to consider, and approval of the newly developed sample archive strategy.

Naomi Feger reported that EPA ORD is conducting a nationwide pilot study to analyze pharmaceuticals in fish tissue and that fish from a few sites in CA will be included in the study. The study investigated 24 compounds, seven of which were detected in fish. The report is expected to become available in the Fall of 2009. More information can be obtained from Peter Husby at the EPA Region 9 field station. Luisa Valiela can provide an update with study details.

David Sedlak indicated that fish from SF Bay and other sites in CA can be used as a background site since pharmaceutical compounds will likely not be detected; fish from wastewater dominated streams will contain the highest concentrations.

Richard Grace reported that AXYS is participating in an EPA holding time study for pharmaceuticals in biosolids, effluent, surface water, drinking water, and soils/sediments. Their current analyte list includes 74 compounds and they may add 47 additional compounds. This is a work in progress. Brian Engler at EPA Office of Water is the primary contact for more information.

B. Update on 2008 Pilot Study: Alternative Flame Retardants

Susan Klosterhaus presented an update on the 2008 alternative brominated flame retardant (BFR) pilot study, in which concentrations of BFRs used to replace PBDEs will be determined in SF Bay wildlife and sediment samples. The analytical work is being conducted by Heather Stapleton at Duke University. Susan reviewed the results of work conducted in the last year to identify the chemicals present in Firemaster 550 and determine their concentrations in SF Bay Area biosolids. She noted that although they've also been detected in house dust collected in Boston, there is no information in the peer-reviewed literature on their potential toxicity or fate in the environment. In Bay sediments collected in 2007, DeChlorane Plus (DP) and pentabromoethylbenzene (PBEB) were detected at low concentrations (< 1 ng/g) and hexabromocyclododecane (HBCD) was detected at only one site (5 ng/g in Richardson's Bay). Susan indicated that the concentrations of DP in Bay sediments are an order of magnitude lower than concentrations reported for the Great Lakes by Ron Hites' group. Richard Grace reported that Environment Canada has also analyzed DP; he will email this data to SFEI. DP follows a similar spatial trend that we see with BDE 209, where concentrations are highest in the South Bay/Lower South Bay. Karin North indicated that there are three WWTPs in the South Bay and there is less mixing there, which are likely reasons for this trend. PBDEs were also detected in Bay sediments, consistent with RMP S&T monitoring results. Most other BFRs were not detected in the sediments.

Susan reported that no BFRs except PBDEs were detected in the sport fish samples, which were collected in 2006. Duke University is currently analyzing the harbor seal blubber, cormorant eggs, and bivalve samples and anticipates having the data available in the next month or two. One component of Firemaster 550, di(2-ethylhexyl) tetrabromophthalate (TBPH), has not yet been analyzed in the samples due to analytical method development issues. Once the wildlife tissues have been analyzed at Duke, the extracts will be sent to Skidaway Institute of Oceanography for analysis of the HBCD isomers and TBBPA. Lee Ferguson suggested that the degradation products and metabolites of TBPH may accumulate and suggested that a metabolism study be conducted. Susan indicated that Heather Stapleton is currently investigating the degradation of photodegradation of TBPH and 2-ethylhexyl 2,3,4,5-tetrabromobenzoate, the other brominated component of Firemaster 550 using toluene as the solvent. Both David Sedlak and Lee Ferguson commented that the use of toluene would negate the application of these results to the environment as toluene would undergo photolysis and serve as the electron donor.

David Sedlak suggested that we attempt to determine the halogenated components of our tissue samples using broad scan methods with ECD or other advanced analytical methods (e.g. Time of flight MS). Richard Grace suggested that GC-GC time of flight methods would be a good approach and that we may want to consider analyzing the PBDE metabolites in fish blood. Kim Hooper suggested looking at BFR metabolites in seal blood since you can get higher volumes compared to fish.

Regarding the detection of HBCD at Richardson's Bay, Naomi Feger commented that sewage spills there have been reported but that no outfalls are present there; the WWTP discharge is through Raccoon Straits. She noted that a pathogen TMDL was just completed for Richardson's Bay and that there is a history of ship-building in Sausalito, which may be a factor. Susan noted that HBCD is primarily used in insulation.

Lee Ferguson asked if silver data existed for the Bay, which could be used as a tracer for wastewater effluent. Karin North said that the Bay area treatment plants are in general pretty efficient at removing silver so the silver concentrations are very low.

Action Items:

- Develop pilot study to examine halogenated compounds using ECD/NIC to identify potentially significant compounds that may be currently overlooked (e.g. metabolites).
- -Contact Richard Grace to get any available Dechlorane Plus data

C. Update on 2008 Special Study: Perfluorinated Compounds in Seals

Meg Sedlak presented an update on the 2008 special study investigating perfluorinated compounds (PFCs) in SF Bay harbor seal blood. She reviewed data collected in 2007 which indicated that PFOS was the dominant PFC detected in the seals. Concentrations in SF Bay were more than an order of magnitude higher than the reference site (Tomales) and more than twice as high as concentrations reported in seals from other parts of the world. Among the SF Bay seal samples, concentrations were highest in South Bay. Additional samples were analyzed in 2008 from the South Bay to provide a better indication of spatial trends and to determine if PFOS concentrations varied by gender. Though statistics have not yet been conducted, concentrations of PFOS were three times higher in seals collected from the South Bay compared to seals collected in Central Bay. There was no distinguishable difference between concentrations of PFOS in male and female seals. Meg commented that based on a review of the literature, statistically significant differences in age and gender are not usually observed. However, frequently females have lower concentrations of PFOS than males and this is thought to be the result of females offloading PFOS to pups. Meg noted that some of the highest PFOS concentrations were observed in pups.

Meg also noted that the concentrations of PFOS in seals from Tomales are similar to the concentrations observed in human blood. Richard Grace stated that recent work has indicated that PFCs bind to blood proteins, and is thought to be the reason why concentrations in blood are generally higher than breastmilk.

David Sedlak commented that these data suggest a reason to be concerned about PFCs in SF Bay animals. He asked if future projects could address opportunities for reducing PFOS concentrations in the Bay. Karin North said that source control opportunities for PFCs are unclear, similar to the PBDE issue. David asked if others were aware of sources other than WWTPs and that we should discuss the potential for investigating other sources to the Bay in future projects. Jennifer Field agreed with David and noted that WWTPs are not in a position to mitigate the flow of PFCs and that source control is the best approach. She stated that randomized sampling is needed.

Naomi Feger stated that the Regional Board has collected information on landfills and that they are not leaking to the Bay; she also followed up with the Groundwater Division Chief and was told that this pathway is likely not significant. Jennifer suggested using ratios, particularly the C4 PFCs, to look for sources. She commented that PFOS was phased out in 2002, that there will be a long 'bleed off' of old PFOS currently in storage as facilities use up reserves of foams. Trish Mulvey suggested that we try to control the use of PFOS in fire-fighting foams. Meg noted that there are exempted uses to consider as well such as metal-finishing uses. Jennifer stated that the use of firefighting foams is episodic and that PFOS in the Bay is more likely to be the result of the slow

bleed off from other sources. Karin North noted that the City of Palo Alto is conducting a study with Stanford on the effect of reversed osmosis (RO) systems on concentrations of emerging contaminants. AXYS Analytical will be conducting the analysis for this project. David asked whether City of Palo Alto was switching to RO, which Karin said they were not and that this was merely a research opportunity.

Jennifer noted that 1,4-Dioxane is on the drinking water CCL-3 list and asked whether it was being detected in the Bay. Tom Moore is looking into this issue.

D. Update on Pro Bono EC Activities

Susan Klosterhaus provided an update on pro bono analytical work conducted on Bay samples in the past year. Rob Burgess and Mark Cantwell at the US EPA NHEERL in Narragansett, RI analyzed triclosan in ten sediment samples collected during 2008 S&T monitoring. Triclosan was detected at seven out of ten sites above the detection limit (5 ng/g dry weight). Concentrations ranged from 5-10 ng/g at the Central and South Bay sites, with the highest concentrations found in Central Bay. The triclosan concentration at the site near the San Francisco airport was the highest (40 ng/g) among the samples analyzed and was at least four times higher than the other sites. Concentrations of triclosan in Bay sediments are similar to those observed in other urban estuaries to date. Susan presented a review of what is known regarding the toxicity of triclosan and stated that information on sediment toxicity is not available in the peer-reviewed literature. When the water concentration is estimated from the sediment data using only the sediment-water partitioning coefficient (K_d), water concentrations are below most toxicity thresholds. However, the estimated maximum water concentration is within range of concentrations which caused toxicity to microbial communities.

Kelly Moran noted that there are two WWTPs near SFO, one is the primary facility for the airport and one is only for United Airlines maintenance activities. She indicated that there have been a number of issues with discharge from the airport. Karin North indicated that she had a contact at the SFO airport who would be able to clarify the location of the discharge.

Lee Ferguson stated that he was surprised triclosan was not detected at many of the sites. Karin North noted that Rolf Haden's work has found triclocarban in sediment, which binds to sludge primarily and is usually found at higher concentrations than triclosan. The City of San Jose and City/County of San Francisco may have triclosan data. Richard Grace indicated that he may have more triclosan data as well that he could share. Work by AXYS has shown triclosan metabolites as glucuronides present in urine.

Jennifer Field commented that the triclosan water concentration may actually be lower than the current estimate if you consider the ionic strength and particle reactivity in the water column.

Karin North commented that the finding of triclosan in Bay sediments is a good opportunity to develop a management action for dischargers. David asked whether the City was using chlorine as this will oxidize triclosan. She noted that the City of Palo Alto is moving to UV treatment rather than chlorination.

Kelly Moran commented that triclosan wont be re-register triclosan for pesticide use and in addition the FDA is responsible for regulating the use of triclosan in food products such as toothpaste. Kim Hooper noted that his lab is analyzing raptor and human serum extracts for triclosan.

Susan also provided an update on analytical work conducted by Gregg Tomy at the Canadian Department of Fisheries and Oceans in Winnipeg, which analyzed short chain chlorinated paraffins (SCCPs; also called chlorinated alkanes) in three samples of white croaker collected in 2006, three samples of cormorant eggs collected in 2006, and three samples of harbor seal blubber collected in 2007. SCCPs were not detected in the fish samples (<0.9 ng/g wet weight). The mean concentration of SCCPs was 40 and 5 ng/g in seal blubber and cormorant eggs respectively. These concentrations are an order of magnitude lower than those observed for marine mammals in the Arctic and fish collected from the Detroit River. Susan noted that the concentrations of SCCPs in the Bay samples are at least an order of magnitude lower than other halogenated chemical contaminants (PBDEs, PCBs, OC pesticides) in these samples. Concentrations of SCCPs in Bay samples are also orders of magnitude below existing toxicity information, which is very limited.

Kim Hooper mentioned that the National Toxicology Program has also conducted work on the carcinogenicity of SCCPs.

Jennifer Field commented that SCCPs have high vapor pressures and are very mobile so that SCCPs released in the Bay Area are likely transported to the Arctic, rather than available for uptake here. David Sedlak suggested that the ratios of SCCPs in the Bay could be compared to those in the Arctic to distinguish sources.

Susan also provided a review of polychlorinated naphthalenes (PCNs) and an update on the proposal to analyze them in Bay samples. Due to their dioxin-like toxicity and known presence in PCB mixtures, the workgroup recommended at the April 2008 ECWG meeting that the RMP analyze a small number of tissue samples, but that the study should be small in scope. Susan pointed out that the RMP is beginning a five year study to monitor dioxin in the Bay and if PCNs are analyzed, this analysis should be conducted concurrently so that a complete picture of dioxin-like toxicity can be determined. She presented potential analytical scenarios and asked the group for feedback on whether or not to conduct the PCN pilot study.

Jennifer Field noted that if PCNs are consistently the same percentage of dioxin-like toxicity then there may not be a need to do PCN analysis here. Susan stated there are only a few studies where we have this information available.

Naomi Feger commented that the PCB TMDL includes the coplanar (dioxin-like) PCBs. Since there is a strong correlation with PCBs, the PCB TMDL may reduce PCN concentrations as well. It was noted that analysis of PCNs would reduce the uncertainty. Naomi indicated that she did not support the collection of additional PCN data as she thought that the risk from the contaminants would be covered by the PCB TMDL.

Richard Grace commented that PCNs were detected in humans as part of the NHANES study. He also noted that contamination in the Great Lakes was not a local phenomenon. For more information on the PCN work in Michigan, Richard Grace suggested that the RMP contact Paul Helm, who is leading the effort there. He also suggested that information will be gained by the research in the Great Lakes.

The group recommended that the final decision on whether or not to analyze PCNs be made by the dioxin strategy workgroup since it is unclear whether PCNs should be considered an emerging contaminant. The workgroup however does not recommend PCN analysis based on Naomi's comments that the PCB TMDL addresses the issue.

Action Items:

- Contact SFO to get details on SFO outfall locations. Karin North has contact information.
- Check with City of San Jose, CCSF, and Richard Grace on availability of additional triclosan data
- Dioxin strategy group to evaluate whether to include PCNs in strategy.

E. Update and Input on Pilot and Special Studies Selected for 2009

Sources of Perfluorinated Compounds to the Bay

Meg Sedlak presented an overview of the pilot study design investigating sources of perfluorinated compounds (PFCs) to the Bay. The current plan is to analyze wastewater effluent, ambient Bay surface water, tributary water samples, and small fish. In addition to ambient surface water, water sampling would also be conducted near potential point sources including airports, military bases, landfills and refineries. Small fish have relatively small home ranges, so the analysis of PFCs in small fish would be conducted to investigate areas of the Bay where uptake into the foodweb is occurring.

Jennifer Field recommended that the C10 PFCs be analyzed since they will likely be present, will not incur additional analytical costs and are understudied. She also recommended looking at PFC ratios. Jennifer also commented that if local training with AFFF occurs, since this is a specialized application (routine testing to determine if live), a use schedule may be available. Richard Grace said work being conducted by AXYS shows mobile plumes of PFCs from sites but none of these are in the Bay Area.

Karin North suggested that we contact airports for more information. Lee Ferguson mentioned that the Navy trains with live AFFF but that limits probably apply to commercial airports.

Jennifer indicated that it only takes a small hotspot to see the concentrations we have in the Bay.

Karin North volunteered to contact Moffett Field to see if they use AFFF. Naomi stated that Board staff are overseeing the cleanup and could assist if needed. Naomi also mentioned that there is an active air force base in Fairfield and that counties could be contacted for more information on AFFF use.

Jennifer noted that refineries and the Navy store large quantities of AFFF and suggested we contact them for information on past accidents.

David Sedlak and Lee Ferguson suggested adding PFCs to routine RMP Status and Trends monitoring for all matrices.

Action Items:

- Karin North volunteered to contact Moffett Field to see if they use AFFF.

White Paper on Emerging Contaminants from Bay Area WWTPs

Meg Sedlak stated that the scope of work for the white paper was somewhat ambiguous and requested clarification from the group as to the goal and purpose of the white paper.

Karin North commented that the general BACWA understanding of the issue is that pharmaceuticals are only a perceived risk. She said that BACWA is under enormous political pressure to determine the risk of pharmaceuticals in effluent.

Lee Ferguson noted that pharmaceuticals are not the only concern in wastewater effluent and that they shouldn't be singled out because they are in the news. He suggested that a rationale approach be undertaken by considering production volumes, toxicity, occurrence, etc.

Jennifer Field asked how influential a white paper would be. She suggested it could be used to start a dialogue on educating the public to not use WWTPs as drug disposal systems. Karin North said that WWTPs are viewed as needing to take responsibility for the issue and that a white paper won't help because the process to educate the public is already underway.

Kelly Moran suggested looking at biocides in the white paper. She noted that EPA is looking at how to incorporate biocides into the regulatory framework. Kelly suggested looking into PHMB, a chemical used in swimming pools, that is not well known. Including it in the white paper would help begin a dialogue on it. David Sedlak noted that this is likely more of an issue for urban streams than for the Bay.

David Sedlak commented that this white paper scope may not be possible with only a \$30,000 budget. He noted that this is too much to ask for a white paper and that much of this has already been done in literature reviews. He said the white paper needs to be specific to SF Bay.

Mike Connor asked David if his recommendation would be a spatial map of WWTP dilution in the Bay. The map would provide an estimate of the % of water at each point in the Bay that is from WWTP effluent. David Sedlak indicated that this is what he had in mind for the white paper as it would not be pollutant specific but rather would allow managers to indicate that many of these compounds are diluted to concentrations that are unlikely to present a significant risk.

Karin indicated that BACWA is hoping that the white paper says that pharmaceuticals are not an issue for the Bay. She recommended a short (~2 pages) fact sheet addressing the issue in addition to a review of the literature.

David Sedlak noted that there is no way to prove that pharmaceuticals will not affect the Bay.

Lee recommended that if we are interested in addressing differences among sites, that the white paper could focus on a least and worst case scenario of effluent effects based on published papers.

Karin suggested that the white paper be similar to the Oros and David qualitative study which focuses on the state of the science and includes a management piece. This would assist BACWA

with fielding calls from reporters. It was noted that a white paper would increase the confidence level.

The final recommendation from the workgroup was to draft a white paper that addresses representative chemicals from the various classes of pharmaceuticals and includes a dilution model for the SF Bay. It was recommended to look at the EPA list of pharmaceuticals to determine the final list of compounds on which to focus for the paper. There is no reason to choose a particular chemical over another when selecting 'representative' chemicals unless toxicity information is available.

F. RMP Pesticide Monitoring - Recent Changes to S&T

Don Yee presented an overview of pyrethroids and current information on toxicity and pesticide monitoring in the Bay Area. He indicated that this year the RMP began monitoring pyrethroids in sediments.

Kelly Moran commented that DPR did a similar exercise of listing the top pesticides to monitor based on the ratio of use to toxicity. She said that the RMP top 15 is similar to the DPR list. She also noted that trihalomethrin is often reported as not detected when it actually was not measured. She suggested that we make sure it is reported correctly.

G. Urban Pesticide Usage – Contaminants of Concern

Kelly Moran presented an overview of urban pesticide usage and trends in the Bay Area. The focus of the discussion was to determine pesticides of concern for surface water quality. Kelly indicated that more than half of the pesticide use in California is due to urban uses. She noted that biocides (triclosan, pentachlorophenol) are largely understudied and that current pesticides are not being monitored. Kelly suggested that antifouling paints (Irgarol, zinc pyrithione, copper pyrithione) are relevant to the RMP and are very toxic.

Analytical methods aren't available to detect most pesticides at environmentally-relevant concentrations. Kelly's recommendations included efficient toxicity testing, monitoring pyrethroids, as well as fipronil, pentachlorophenol, malathion, and carbaryl, and monitoring near potential sources, including marinas, creek mouths, POTW discharges, and near agricultural sources in the Delta. She also noted that determining concentrations, loading, and toxicity associated with storm events is important. Regarding pyrethroids, Kelly noted that 80% of the reported pesticide use is by professional applicators in urban areas and that we are also now seeing water column toxicity. Kelly also noted that pesticides are routinely applied to impervious surfaces surrounding structures, often by professionals. Ordinary use according to label directions, rather than misuse and dumping, is sufficient to cause problems. Kelly also recommended looking at diazinon and chlorpyrifos runoff from the Delta. Kelly noted that application of pesticides in western states tends to exacerbate the problem as there is little potential for infiltration (e.g., vegetative swales are not common in drier western states).

Lee Ferguson concurred with Kelly regarding her recommendation to track fipronil. He indicated that the mechanism of action tends to target arthropods causing significant mortality to organisms such as crayfish.

Kelly noted that having more Bay data on pentachlorophenol (PCP) would be very helpful since its use is still allowed for telephone poles. Hepta- and octa- dioxin congeners are also present as byproducts in PCP mixtures. Don Yee noted that these dioxin congeners are the same ones in the combustion signature.

Action Item:

- Consider developing a pilot study to address the storm water load from the presence of PCP/dioxin in telephone poles.

H. Specimen Banking Protocol

Susan Klosterhaus presented a summary of the sample banking protocol recently developed for the RMP. The current document is the draft of an 'ideal' strategy which has not yet considered limitations due to budget constraints and low temperature storage logistics. Prior to implementation of the new procedures, she indicated that the next steps will be to (1) review the current inventory of samples stored in the archives and determine what is worth keeping, (2) determine the freezer space needed to accommodate previously collected samples and those not yet collected, and (3) determine low temperature (-80 C) storage options based on the funding available. Susan reviewed the purpose of the Specimen Bank and the advantages and disadvantages of -20 and -80 C storage. She summarized the types of samples to be kept in storage, the storage conditions for each sample type, and the plan to monitor chemical degradation in storage using a NIST mussel tissue standard reference material. Susan also pointed out an additional option for the handling and storage of the bivalve samples. Currently, a separate package of whole bivalves is shipped to the storage facility, where they are stored whole in plastic bags. Disadvantages of this procedure are (1) additional storage space needed to store whole bivalves, (2) desiccation of the tissue over time, and (3) the fact that these bivalves are not ideal for re-analysis of the sample for QAQC purposes because it is not a true replicate of the original composite used for chemical analysis. An option to alleviate these concerns is to only store sub-samples of each of the homogenized composites used for chemical analysis (one each for inorganics and organics) in the archives. Susan also reviewed options for storing the RMP samples at -80 C, which include storage at SFEI, storage at a commercial facility, and partnering with another research group. It was acknowledged that a likely possibility would be to reduce the number of samples kept in -80 C storage if the costs of storage are higher than those feasible with RMP funding.

Kim Hooper commented that it is important to know upfront what the available budget is since storage at -80 C is very expensive. Further prioritization will likely be necessary.

Paul Salop commented that in the past, research groups have requested RMP samples to look at biological endpoints (e.g. foraminifera) and that we may want to consider these needs as well. Lee Ferguson noted that the decision to store samples at -20 or -80 would be affected by this since -80 C storage is usually required for biological samples.

Lee suggested that since the samples are not likely to degrade in the first few years of storage, we could store all the samples at -20 C for the first three years and then transfer them to -80 C.

Jennifer Field suggested that we contact the research group in Japan that has set up a -80 C storage facility for this purpose. It may be possible to store our samples there.

Lee commented that he liked the idea of homogenizing the bivalve samples prior to storage. He said this may be better than having the bivalves in the shell, where they would be exposed to potential air contaminants as well.

Jennifer suggested the possibility of storing a blank sample with the other samples. She noted that this was important for identifying contamination of PFOS. The challenge would be identifying a suitable surrogate matrix.

It was noted that the cost of a -80 C freezer is \$5-7000.

The Department of Public Health in Berkeley may have -80 C storage space available. Richard Grace suggested contacting the NIH, which has a large -80 C facility.

Action Items:

- Contact Richard Grace to get NIH contact information. Contact NIH to determine if their low temperature storage facility is an option for storing our samples.
- Contact Jennifer Field to get contact information on the low temperature storage facility in Japan.

I. Bioassay/Chemistry Study of Wastewater Contaminants

David Sedlak presented a summary of work conducted recently in his lab investigating estrogenic compounds in California's inland waters. Steroid hormones and alkylphenol ethoxylates (APEs) were quantified in water collected from several sites throughout the Delta, Sacramento and Joaquin Rivers, and Napa. Sites near rangelands contained the highest concentrations of estrogenic compounds, compared to dairies and other river sites. Approximately 20% of the rangeland sites contained concentrations above the predicted no-effect concentration, where as less than 5% of the other sites contained concentrations above this threshold. David also presented results of in vitro (trout liver hepatocytes) and in vivo (rainbow trout) exposures of rainbow trout to water extracts and TIE experiments. His work to date has shown that estrogenic activity was consistently observed at some sites, that in vitro and in vivo toxicity at Napa and Delta sites, and that the activity is not due to steroids or nonylphenol. TIE results suggest two different causes though they have not yet been able to identify these.

J. Discussion of Potential Pilot and Special Studies for 2010

Ideas for 2010 pilot and special studies were solicited from the group. Suggested study ideas included: scanning of seal blood or other wildlife tissue for halogenated compounds (also suggest this to Gail Krowech at OEHHA for the CA biomonitoring project), triclosan/triclocarban, quaternary ammonium surfactants, fipronil, stormwater loads of pentachlorophenol (PCP), and bioassays. It was noted that the sources, pathways, loading workgroup is focused on monitoring of pesticides in stormwater and perhaps PCP could be added as a target analyte in those studies.

H. Next Meeting

The next ECWG meeting will be Friday April 17th, 2009.

Summary of Action Items

| Action Item | Who | Comments |
|---|-------------------|----------|
| Obtain information on USEPA fish study | Luisa Valeila | |
| Obtain AXYS Dechlorane Plus data | Susan Klosterhaus | |
| Develop pilot study to examine halogenated compounds using ECD/NIC to identify potentially significant compounds that may be currently overlooked (e.g. metabolites). | Meg Sedlak | |
| Contact SFO to get details on SFO outfall locations. Karin North has contact information. | Meg Sedlak | |
| Check with City of San Jose, CCSF, and Richard Grace on availability of additional triclosan data | Susan Klosterhaus | |
| Dioxin strategy group to evaluate whether to include PCNs in strategy | Susan Klosterhaus | |
| Consider developing a pilot study to address the storm water load from the presence of PCP/dioxin in telephone poles. | Meg Sedlak | |
| If possible, send a copy of Bruce Brownawell's presentation on quaternary ammonium compounds to Karin North | | |
| Contact Richard Grace to get NIH contact information. Contact NIH to determine if their low temperature storage facility is an option for storing our samples. | | |
| Contact Jennifer Field to get contact information on the low temperature storage facility in Japan. | | |