



RMP Sources Pathways and Loading Workgroup Meeting **October 25th 2011, 10:00am - 4:00pm** **Meeting Summary**

Title

Introduction

Review and approve May 2011 SPLWG meeting summary

Introduce Roger Bannerman (invited technical expert to the WG)

Summary and status of action items

- HSPF Guadalupe model report is still to be wrapped up
- We took the recommendation of the SPL to hold a 2nd WG meeting in 2011
- Budget proportions for STLS slated projects are still under review – we can take into account technical advice from SPL
- SPL has reviewed the Mallard Island report. Unclear of future monitoring at this location.
- Zone 4 report is in the final stages should be out for review soon.
- Full draft of the EMC lit review/year 1 spreadsheet model out soon for review. Will incorporate today's review comments into the report before sending out for formal review.
- Conductivity recommendation has not been followed up on.
- More of our work in the peer reviewed literature – we are putting MI and Zone 4 report into the literature.
- Have not followed up on further sleuting into toxicity samples.
- Brought Roger Bannerman on to the WG.

Update on SPLWG / STLS interactions / governance

- **SPL** – meets 2 times/year. Technical oversight of the SPL.
- **STLS** - one of the RMP strategy groups for stormwater POC loads monitoring. Planning level for stormwater monitoring. Frequent communication with meetings, phone conferences, and phone communication. Technical review by SPL if the decision process can be timely.
 - **AF** – issue brought up to see how communication with SPL advisors is working. How is the 'opt in' approach working. The strategy work runs under the radar of SPL advisors. Default is that SPL members will get STLS updates at the 2 meetings.

Studies framework and methods overview

- STLS is working to answer 4 management questions Impairment, Loads, Trends, Measuring success of management actions. This is the framework for today's meeting and feedback.
- Review of the current budget planned for STLS activity
- Bulk of funding is targeted towards bottom of the watershed loads monitoring – about \$1million for monitoring 6 watersheds
- MS – activities are supporting each other (spreadsheet model, EMC loads, POC monitoring)

Multi-Year Plan (MYP) and studies conceptual model

Very brief overview of the MYPv2011

- Handout shows the outcome of STLS meetings and discussions
- Multi-year plan was reviewed by SPL in May – table shows comments that were incorporated

into the MYP.

- Appendix B – spreadsheet model
- Appendix C – sample optimization study – looks at number of events and sample number for PCBs and Hg
- WY2011 reconnaissance study findings will live in MYP
- QAPP placeholder
- Source area monitoring is a placeholder for EMC monitoring
- 3 year RMP commitment to support POC monitoring, spreadsheet model, and EMC monitoring
- Room within the permit for an alternative, similar effort to answer management questions
- Information gaps
 - What are the linkages in management actions. How does this all fit together and what have we learned
 - Bay modeling – depends on other WGs and how SPL and modeling workgroup meets up
 - Loading estimation – spreadsheet model and POC loads monitoring
- Schedule – twice yearly status reports until the draft POC report in Spring 2014
- Outstanding questions – 2 more watersheds on line in WY2013 or an alternative approach?
- Provide any MYP input via email

Overview of currently employed / proposed data collection methods

Review: Results from WY 2011 POC Monitoring in 16 Watersheds

- Needed more information on more watersheds in order to select long-term sites for MRP
- Site selection criteria – selected 30 from 200 potential watersheds based on mix of large and small watersheds, equal distribution in the 4 MRP counties, representative of common small to medium watersheds
- Did a recon of 30 watersheds and selected 17
- Aimed for 1 storm per site for a host of POCs
- WY2012 sites selected are GR, LMC, SLC, East Sunnyvale Channel
- PM – how will WY2012 data be used? To answer questions on POC loads, concentrations, and trends and how POCs impact the Bay Margins. Margins are more impacted with contaminated sediments. PM – how is ranking of watersheds in terms of POCs used in WY2012 site selection.
- WY2011 data were ranked according to pcbs and Hg.
- Selenium – only monitored in CCC watersheds. Dissolved Se on average 35% of the total
- PBDE – 20 samples – dominated by PBDE 209
- PAH – 22 samples – fairly high concentrations at E.Sunnyvale. PAHs, across watershed, lines up quite well with imperviousness
- Mercury – Zone 5 Line M had highest THg concentration. San Leandro surprisingly high
- Concentrations vs particle concentrations – median concentrations can often rank a watershed higher than if the data are normalized for sediment. If toxicity endpoint is of concern than concentrations should be explored. But for loads – particle concentrations may be the more suitable metric.
- Statistical tests – 1) can we differentiate high vs low POC watersheds – can see this in the data but not as important to statistically test
- PCB – LMC a bit lower, Sunnyvale Channel on higher end. MS – what are sources for high

PCB areas – Santa Fe is a high industrial area, near Chevron oil refinery, Port of Richmond, scrap metal recycler – more of a use source area rather than manufacturing. PCB intercept rather high – suggests that some PCBs are entering drainages as dissolved or emulsion phase rather than particle based.

- CS – many of the watersheds that showed higher POCs have future monitoring and potential management actions
- BM – are there ongoing management actions in some of these watersheds?
- CS – yes
- Return to Peter's question about how WY2012 loading data will be used.... For input into spreadsheet model? Not specifically. Peter has concerns about this since it is difficult to tease out land uses. 3 uses for 2012 monitoring: supporting need for the Bay Model, *calibration* of the spreadsheet model, and long term trends analysis

Review: Discuss Monitoring Plan for WY 2012

- Locations, analytes, methods, progress to date etc

Desired outcome: Receive technical feedback on monitoring design for consideration in future years

AI: how did we select the toxicity tests? Jen thought part of permit and Jan said no. Jan and Jen to talk offline to work out.

AI: Do we have the speciation of the nutrients that we want for developing the nutrient strategy? Dave Senn suggests ammonium be collected and possibly frozen for later analysis.

Dave Senn: May be good to look at how organic carbon varies as a percentage of the PCBs or other analytes. **AI:** Alicia and Jen to discuss more with Dave Senn offline how to use TOC in the WY 2011 analysis.

Barbara Mahler: Says that USGS has typically collected lots of individual samples and then manually composited them with a churn splitter back in their non-clean laboratory. Done this for pesticides and other analytes. **AI:** STLS group to discuss further with Barbara about this.

Gavin: In Sydney Estuary it came as a surprise how much illegal dumping there is and he isn't sure that is addressed in the design. Also, watersheds have very different chemical signatures may want to interpolate across watersheds with reservation. LM response: a 3 year effort and will evaluate validity of turbidity surrogate regression method to see which watersheds it does and does not work well for.

Dave Schoellhammer: Noted high flows that have already passed this season. Have we missed first flush? Lester response: early season storms have elevated signal and so our definition of first flush includes the first several storms of the year.

Paul Salop: Will all the 2012 watersheds have the same first flush or the smaller watersheds possibly first and the larger storage watersheds later. Lester: we'll do the best we can this year. Mike Stenstrom: in his experience, the largest and most pervious watersheds have the smallest first flush effect (here, Mike is referring to the rise of the hydrograph, not the first-of-season storm.

Dave Schoellhammer: this coming wet season, they have an acoustic Doppler and turbidity sensor ...where?

Lunch provided

6	Review: Spreadsheet model
6a	<p>Spreadsheet model: Hydrology model structure and progress</p> <ul style="list-style-type: none"> • Year 1 – base rainfall-runoff model, initial contaminant model, lit review <ul style="list-style-type: none"> ○ Approach 1 Impervious model vs. Approach 2 land use type – Browne model worked the best ○ Lack of high imperviousness watersheds in data ○ Increased the resolution of land use and increased the number of watersheds with high impervious areas ○ AF – how was hydrology developed for pump stations. Knowledge the number of pumps and the pump flow rate with rainfall can estimate runoff. ○ LM – we will look at the pump station data and how this influences the model ○ Spatial Mismatch between land use layer and the stream gauge data ○ Splitting out the runoff data into decades – see an increase in runoff coefficients over time ○ Replaced the data layer with ABAG 2005. ○ Refined categories for runoff coefficients – created additional land use categories ○ AF – ABAG used their data set to show economic patterns not land use ○ AA - CS – will share their land use categories with SFEI ○ Gavin – have we compared our model results to the literature? ○ AF – the stormwater programs have done this comparison. ○ PM – what prevents you doing this sort of study at a sub-watershed scale? Time and budget ○ Runoff coefficients were over calibrated from the original data set – need to look into that ○ MS – lg watersheds all calibrate well but sm watersheds do not. Get an averaging effect in larger watersheds ○ RB – errors get larger and larger in smaller watersheds ○ CS – smaller watersheds are closer to the Bay and are more impervious ○ RB – from connected ordinances some areas are connected to storm drains and some aren't – need to have an idea of connectedness ○ CS – averaging may be suitable ○ MS – EMCs come into this too. EMCs by commercial type are very different. ○ LM – ultimate goal is a calibrated loading model based on a good calibrated hydrology model ○ AF – don't want the hydrology to prevent us from making inferences on POCs and we need to understand the limitations ○ LM - +/- 40% in hydrology model may be suitable for seeing 5-10 times differences in POC loads ○ PM – want to be most accurate where the EMCs are highest ○ Using new ABAG 2005 data layer – more land use classified as transportation. Swapping of land uses between transportation, industrial, and commercial. Model performance with the new ABAG layer goes up – probably need to recalibrate. ○ Still a good deal of spread in model outputs for the calibrated model. Does seem that the new model is more representative of a regional output ○ Refine slopes of runoff coefficients? Bay Area has much more dramatic terrain so literature slopes may not be suitable for our region ○ BB – look more closely at transportation land use since it has large effect on

	<p>impervious areas. Can be overestimated</p> <ul style="list-style-type: none"> ○ AF – we did a similar exercise for the brake pad partnership. Without parcel data small roads disappear. There is a land use memo about transportation data layer from this project. ○ RB – mostly working on smaller scales not regional scales. Seems like data used for regional scale are appropriate ○ MS – roads are often included in the residential parcels – so EMCs are estimated lower. Highways are also not often represented as areas – lines only. Also roads go across watershed lines so can skew land use. ○ CS – they add a buffer area to roads in the ABAG 2005 data set ○ MS – nice to see the model is working – you can start to see the impact from assumptions ○ DS – a lot of discussion on spatial resolution in the data set and then there is an output of annual loads. Where does the temporal resolution come in e.g. storm intensity variation? ○ AF – temporal modeling may occur on an individual watershed to see how this would effect the model outputs – time and budget withstanding ○ LM – maybe start working with a contaminant model to see how this turns out ○ RB – want to have a confident hydrology model before starting contaminant modeling ○ MS – may get to a place where we find loads and think we want more resolution there, and where the loads aren't, we decide we don't need more resolution
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<p>6b</p>	<p>Spreadsheet model: EMC literature review</p> <ul style="list-style-type: none"> • Roger: Legacy contaminants in the channel. How to expect decent calibration given this fact? LM: comment is noted. AF: going to be a bigger issue for those watersheds in the middle of the calibration diagram and which are generally less sensitive. • Chris: good records or when sediment is removed from larger watersheds, may want to add this bulk back in to the model; Gavin response: but that will be much coarser than what's flowing through the channel and what POCs are attaching to. • Lester requests recommendations for whether to use the median or the mean of EMCs from the literature: • MS notes: everyone classifies down the land use classifications and everyone does is a little differently • LM and SC discussion: we can use both existing GIS layers as input as well as GIS layers that we develop ourselves if we deem necessary (e.g. sources such as PGE substations, railways, etc.). • BB: should we distinguish the delivery ratio from the upper watershed versus the lower watershed: LM response; no distinction because haven't developed a storage component to this model. BB: Not considering delivery ratio in the larger watersheds will lead to an overestimate. LM: will be a bigger challenge with the selenium model. • CS: apply Prop 13 sediment dataset to the ABAG 2005 land use layer to see there are good correlations. AI: SFEI will look into this. • PS: the areas ringing the Bay are the ones we will never be able to ground truth because of the tidal prism. AF: all of this is on the plate of the Bay Margins modeling effort. • CS: is step one regarding GIS of source areas a historical look or a current look at land uses? Something for us to think about... CS: we should really try to utilize the
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	<p>existing sediment data to understand how land uses at specific sites may be driving land uses. May want to develop buffers around each point to consider how neighboring watersheds might be contributing. Look at in relation to historical industrial, too.</p> <ul style="list-style-type: none"> • Dale: other chlor-alkali plant was in Pittsburg. Others in room noted one was in Oakland. • CS comment on Lester's source data hypotheses: recycling facilities are now highly regulated and the source data be outdated on this. • RL: Fossil fuel combustion category may actually be driven by coal combustion that may be going on these areas. • AF clarifies that we just need to make forward progress on developing loads estimates, but we do not necessarily need to get out in the field this season. <p>Reactions from local advisors:</p> <ul style="list-style-type: none"> • Schoellhammer: may want to use literature to just get a range/probable distribution of EMCs for each contaminant and do a Monte Carlo type scheme. • Roger and BM: connectivity issues in the model. Not all soils from each land use may get down into the creek. Is there a way of weighting different areas of contribution? • PS: notes that the soils data was originally intended for source hotspot identification and not for this use. Should keep this in mind. •
6c	<p>Spreadsheet model: Contaminant model structure and progress</p> <ul style="list-style-type: none"> • Input data: EMCs and POC loads. • Back calculate EMCs from WY2011 recon data. Many negative results – not optimum approach. Could do a constrained optimization approach (throw out negative results) – recommendation #1 for Year 3. • BM – could you use positive matrix – you would only get positive results. • MS – well behaved data set then ran a constrained technique which gave some dubious results. • Develop GIS layers to incorporate POC source areas into model, as recommended by EmC lit review and supported by existing data. • Rec #3 – refine the sediment model. Could use an universal soil ?? Also look at landslide data set. •
7	<p>Review meeting outcomes / Determine next meetings / Adjourn</p> <ul style="list-style-type: none"> • RL – consider post meeting materials to an FTP or web site prior to the meeting for access