DMMP Monitoring Ideas/Brainstorming Workshop on June 20, 2018 Comment-Response Table

PURPOSE: To provide DMMP agency responses to ideas generated during the Monitoring Ideas/Brainstorming Workshop and feedback on which ideas are being considered during ongoing development of a revised monitoring framework

Category	Description
1	Ideas that we **can incorporate or think about** in our plan of action or as we revise the monitoring framework
2	Ideas that we **can potentially incorporate**, but may need some work
3	Ideas that we **cannot incorporate** because they are impractical, don't meet SOPS, outside DMMP jurisdiction, or are otherwise not applicable.
4	Other/No response required

NOTE: Comment numbering was assigned sequentially based on the order that comments were recorded in the section titled "Summary of Brainstorm Discussion" from the Detailed Meeting Notes, and are arranged here by subject.

No.	Comment/Idea	Category	DMMP Agency Response
1	Are we asking the right questions? Should we be starting with the existing questions or should we be starting from scratch?	2	We are keeping the existing questions since they were designed to address on-site and off-site conditions established in the PSDDA Environmental Impact Statements and, specifically, to determine if Site Condition II is being met. However, we agree that there may be additional questions (or rephrasing of questions) that may be beneficial and/or necessary.
2	Consider whether there are baseline studies that need to be conducted (but not repeated) to help design the monitoring program and answer some of the basic questions about what is happening and the extent to which there are issues, versus elements that should be part of the routine monitoring program over time.	1	We agree. As the proposed revised framework is developed, we will compile a list of special study topics.
Offsite Chemistry/CTS			
3	Question 1, hypothesis B [offsite] – how to account for chemical of concern (COC) increases due to other factors (in COCs around disposal sites) especially given what we now know about general regional contamination.	1	We acknowledge that regional contamination is a concern at selected disposal sites and are working on various ways to address this issue. One idea under consideration is that only off-site sediment that has been confirmed as dredged material (thru SPI or other method) would be compared to SMS. This would help ensure that we are focusing on the signal from dredged material rather than the noise from regional contamination.
4	Chemical tracking system (CTS) has issues – update program, don't use estimated data since this leads to finding significant trends in low concentration data. Nexus to bioaccumulation?? Strength of CTS program was that it looks at all COCs in a given class at the same time as indication of problem. Better to focus on tracking specific bioaccumulative chemicals.	1	We concur that the CTS is outdated. It is likely that use of this evaluation tool will be discontinued and that other methods to track the effects of dredged material off-site will be implemented.
7	Hypothesis B in Q1 – Do we need to keep it? Wasn't this just serving as a failsafe in case we couldn't accurately monitor the disposed material? But we've shown that we can monitor it with SPI so we don't really need these transects to answer this question. Alternatively, we could move hypothesis B to Q3.	1	We agree that this hypothesis may be better placed under Question 3.
Regional Background Considerations			
8	How do disposal sites fit into Regional Background (RB) framework? We only have RB for a few isolated areas. Are disposal sites tracking what's happening in surrounding water bodies? Scales of RB are massive. Would be sensible to combine data from other programs to derive RB. Particularly important for Commencement Bay and Elliott Bay.	2	The DMMP agencies are obligated to manage the disposal sites so they do not become cleanup sites under Part V of SMS. Defining the CSL is crucial for determining a cleanup site, and under Part V the CSL is the highest of risk, regional background (RB), or the Practical Quantitation Limit (PQL). The DMMP is considering developing a benthic tissue data set which would define a type of "regional background" or "environs" for each of our disposal sites. We would coordinate with Ecology's Toxics Cleanup Program (TCP) to ensure that our approach is consistent with their regional background approach or utilizes an appropriate surrogate (such as a disposal site environs-specific tissue level).
9	RB not fixed in time, though; it is ever-changing. If RB used as a guideline, DMMP would have to track that. Clear that the DMMP will need to get more data to do anything with RB.	2	We acknowledge that RB is not fixed in time, and that we would need to maintain close communication with TCP if we were to adopt an approach to managing bioaccumulatives at the disposal sites that utilizes RB.
10	Concern about off-site impacts: If we eliminate COC analysis of transect stations (as has been proposed today), would we lose important comparison point to RB? The critical measure is if we exceed RB at transect (or perimeter) stations.	4	The DMMP's concern with transect stations is that, as currently implemented, they don't track off-site migration of dredged material very well and so are a poor tool for measuring offsite impacts. While we may discontinue use of the existing transects, there will still be some kind of off-site monitoring in their place. As the monitoring questions state, it is an essential point of the monitoring that we are evaluating the effects 'due to dredged material', not due to regional or other influences.
26	What increase in COC concentrations would we need to see at a site to get a statistically significant difference in RB concentration for a given area? It would put the site in context. [For example:] How important are disposal sites for orcas, mammals and fish?	3	We understand the point about how small these sites are relative to the entire area, but DMMP's periodic ESA consultations are based on conditions at the sites, not on the relative contribution of the disposal sites compared to the surrounding area.
	Another approach would be the comparison of COCs (sediment or tissue) to RB with the goal of not exceeding RB (rather than accounting for the site's contribution %). That approach would probably be easier to explain to others.	1	With regard to comparison to RB, we agree that is an approach worth considering further, and one that is likely to be consistent with Ecology's definition of CSL for many bioaccumulative COCs.

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Disposal Site Tissue Data			
13	We have a huge data gap given that there is so little tissue data for our disposal sites. Do we have data for what species are present on site?	3	We agree there is a data gap. We have benthic species abundance data from transect stations (which are offsite) but not from onsite stations.
14	Do we even need on-site tissue data? We change the nature of the sites all the time by disposing dredged material. Monitoring at perimeter stations makes more sense because these shouldn't change (much). It would be better to monitor species that are in the area in and around the sites. What are the possible non-mobile benthic species?	1	At this point we do think on-site tissue data is needed to be able to start answering the question of whether there are any unacceptable effects to biological resources on-site. Collecting this data would be the first step in determining whether there is a need to re-visit bioaccumulative COCs in a broader sense in the DMMP program. Based on previous monitoring experiences, we have found that collecting sufficient tissue mass from even one benthic species (e.g. *Molpadia*) is very difficult. Because of this challenge, we are considering running laboratory bioaccumulation testing as an alternative to analyzing on-site tissue.
16	If there's nothing to eat on-site (assuming dredged material disposal buries existing benthos), then what's the issue? This condition will be different for frequently used sites vs infrequently used sites. Disturbance changes the benthic habitat all the time. Ground zero changes all the time.	4	Past monitoring results have shown that the disposal sites recover more quickly than originally thought. SPI shows benthic re-colonization shortly after disposal events. We often see Stage III on I communities on-site during monitoring. Also, mobile benthic infauna move around, including on-and-off the disposal sites. Therefore, the potential for on-site bioaccumulation and subsequent food-web transfer needs to be considered.
21	Q3 Hypothesis E only relates to benthos.	4	Concur. Comment noted.
Sampling Methodology			
6	Role for incremental sampling methodology (ISM)? N=30. Characterizes an area rather than a spot. Current site monitoring design is more focused on toxicity/point-by-point vs. for bioaccumulation which is more concerned about exposure over an area.	2	The DMMP agencies are seriously considering ISM, especially for evaluation of bioaccumulatives COCs.
15	There is value to conducting lab bioaccumulation testing of on-site sediments. Could do so on a sample collected using ISM methods. This would give us a measure of "bioaccumulative potential". We could compare results to bioaccumulation testing of sediments from the surrounding area to put the on-site data in a larger risk context.	2	We agree that conducting lab bioaccumulation testing of on-site sediment and sediment from the surrounding environment could provide useful information. Collecting sediment using ISM methods is also a good idea.
5	Sediment locations for monitoring should track where dredged material goes/went. Dots fixed in time aren't helpful or even meaningful. We have done this with dioxin (randomized stations). We can determine how much sediment accumulated at a given site via the SPI data. Fixed stations already situated there. Tracking bioaccumulative COCs off site – via transects – is more the problem since these don't necessarily track the movement of the lobe/material. We need to fix the transect location problem.	1	We are continuing to evaluate how best to change or add onsite and transect sediment sampling locations to better match the location of dredged material.
19	Would be good to integrate sediment data vertically (ISM – like). We could get a quasi–historical disposal analysis by coring through past disposal layers. Would create higher field costs vs lab costs. But coring in the water depths at the sites may not be practical/possible.	3	We agree that coring in water as deep as at the DMMP disposal sites is impractical. Furthermore, toxicity exposure to organisms is only affected by the surface sediments. Material buried at depth does not have a complete risk exposure pathway. Also, there would be no way to determine which depth horizons of a core were ever exposed to the environment or for how long.
25	Confirmatory monitoring could be a parking lot for many of these measures. Q2 is, in essence, verifying that the dredged material evaluation procedures are working. But now that we have 30 yrs worth of data showing that the majority of disposed material doesn't exceed SLs, there isn't the same level of concern. There needs to be a comprehensive look at the history (ranges of concentrations) of COCs at the disposal sites vs what we know went out there (akin to what Windward did for PAHs at Port Gardner and Elliott Bay).	3	Disposal site monitoring is required to ensure that our disposal sites are meeting Site Condition II, and that they comply with SMS Part V. The results of Windward's retrospective analysis of PAHs at the Elliott Bay and Port Gardner disposal sites showed a distinct difference between the pre-disposal median TPAH in the dredged material (approx. 600 ppb) and the median concentrations found at the disposal sites during monitoring (approx. 1,200 ppb). The disparity between these results underscores the need to continue confirmatory monitoring.
Risk-Based Evaluations			
11	Acceptable sediment concentrations based on risk (when calculated) are almost always below natural and regional background. But risk-based sediment concentrations expressly calculated for deep water disposal sites (based on exposure assumptions that are different than those used to calculate risk at near-shore cleanups) might turn out to be above even RB depending on the exposure assumptions used. RB can be measured. CSL as it applies to a particular disposal site should be calculated using the specific exposure scenario that you have for that site (what benthic species are present, food web transfer potential, species with human consumption, home ranges etc.). We need to think about what are the reasonable maximum exposures (RMEs) for sites. To determine site specific biota-sediment accumulation factors (BSAFs) we need site specific sediment and tissue data. This could be tricky because the on-site condition changes after each disposal. More sediment and tissue data and exposure analysis are the type of studies needed for redesigning this program.	2	In 2009, the Regional Sediment Evaluation Team (RSET) undertook a significant effort to develop target tissue levels (TTLs) for the protection of aquatic life, aquatic-dependent wildlife and human health using various methods that took variations in species presence/absence, exposure, and sensitivity, into consideration. In the case of TTLs developed to protect wildlife and human health, the depth of the disposal site (deep versus nearshore) and site-specific human uses were explicitly considered. We are considering using the RSET TTLs (perhaps with some modifications). Regarding development of BSAFs for the disposal site in order to translate TTLs to acceptable sediment values, DMMP has significant concerns with the high variability that is typically seen in the derivation of site-specific BSAFs. The associated sediment values derived from BSAFs can range over an order of magnitude or more. We believe that a more robust and defensible approach to determining disposal site compliance for bioaccumulatives is comparing the results of laboratory bioaccumulation testing from on- and off-site sediments to TTLs .

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	Lines of evidence to determine if we are being protective enough with site management = risk evaluation and determining background.		
12	Important to use a more realistic risk paradigm. For HPAHs, one can make a strong argument that the current SLs are protective for cancer in flat fish. Fleshing out risk issues (rather than simply assuming that risk is less than natural background (NB) and RB) is important for public accountability. Doing this will also answer the question of whether our current TTLs are protective enough.	2	We agree that, for some BCOCs, a detailed evaluation of risk associated with exposure to bioaccumulatives at the disposal sites would help both to improve transparency as well as to evaluate the protectiveness of our current TTLs. It is for that reason that we are proposing to evaluate the applicability of RSET's TTLs to Puget Sound sites (see response to comment 11). Relative to PAHs, we do not agree that there is sufficient evidence to say that our current sediment guidelines (which are based on toxicity to benthic invertebrates) are protective for cancer in flatfish. While it appears that tumor rates have dropped in the flat fish population of central Puget Sound, the role of sediment exposures in that decrease is not known. Note that the DMMP's current SL for total PAHs (17,200 ppb dw) is an order of magnitude higher than the sediment PAH adverse effects thresholds that have been proposed by NOAA based on liver lesions in English Sole.
23	Need to take a realistic look at exposure pathways and exposures related to the deep-water disposal sites. Bioaccumulatives have a totally different scale of effect – can't be evaluated on a DMMU-by-DMMU basis. Overall exposure in the embayment is the relevant context for bioaccumulatives.	2	Our focus at this time is on evaluating and revising the disposal site monitoring framework (which is not based on DMMUs). In general, we agree that bioaccumulation testing needs to incorporate a larger spatial scale, and we are considering utilizing ISM in our disposal site monitoring procedures to address this concern. For concerns regarding exposure pathways at deep-water disposal sites, please see the response to comment 11. RSET has already undergone a rigorous process to develop TTLs to address deep-water bioaccumulation potential.
Toxicity and Bioaccumulation			
18	We need to ask ourselves, what are the practical uses of tissue data generated from bioaccumulation tests using off-site sediment? If we use off-site bioaccumulation data to calculate a [sediment] threshold risk value, would these become new guidelines? [This comment regards a concern about using Target Tissue Levels (TTLs) to generate sediment screening levels and applying the resultant screening levels to both disposal sites and dredging projects.]	4	The short answer is no. However, we understand the concern about using the information gathered from off-site bioaccumulation testing to change dredged material evaluation guidelines. DMMP has existing TTLs, but our BTs (sediment BCOC values triggering bioaccumulation testing) are not based on TTLs or risk and there is no plan to use existing or revised TTLs to derive sediment risk screening levels applicable across all our sites and projects. TTLs based on off-site environs data would be used only to evaluate whether or not we are meeting disposal site-specific goals, or possibly as part of a weight of evidence approach for suitability determinations using bioaccumulation testing data (TTLs, reference, off-site tissue data, and PQLs all taken into consideration). TTLs cannot easily be translated into sediment bioaccumulation thresholds since this process requires site-specific data to develop Biota-Sediment-Accumulation-Factors (BSAF) that are used to translate TTLs to sediment concentrations. SCUM II recommends at least 10 paired sediment-tissue data points over a representative concentration range to develop BSAFs and strongly discourages the use of "generic" BSAFs. RSET, recognizing this challenge, developed TTLs but did not try to generate bioaccumulation threshold values for sediment. During SCUM II development, generic BSAFs were gathered, but they varied widely, often by orders of magnitude. Because of the data requirements to generate site-specific values (both number of samples and need for concentration range), developing project or disposal site-specific BSAFs that would translate TTLs to sediment concentrations is simply impractical. Translating TTLs to sediment thresholds would be especially difficult for mixtures (such as PCBs and dioxins) since a BSAF would have to be generated for each compound in the mixture.
20	Another approach to site monitoring is collecting (and archiving) jars of material from projects disposing at the sites and then running a composite using lab bioaccumulation testing.	4	The holding time for sediment used for bioaccumulation testing is typically 56 days; thus, archiving material for later bioaccumulation testing would result in an exceedance of the holding time. Also, since numerous consultants and labs are involved with DMMP projects, logistically it would be extremely difficult to collect and store sediment from multiple projects.
	Everyone says that bioaccumulation testing is too expensive but lots of areas of the country do it on all projects (we are just not used to this cost).	4	Comment noted.
	Need to develop the thresholds for triggering and judging bioaccumulation test data. Determining the TTL for comparison could be done using disposal site-specific risk-based calculations (discussed earlier). This would improve the decision framework.	2	Please see comment 11
	An easier approach would probably be comparing bioaccumulation testing results to the surrounding area/RB in tissue. Analogous line of evidence was used in the Port of Everett SDM.	2	The DMMP agencies agree and are evaluating possible ideas.

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22	Q2 Hypothesis D could be altered to include bioaccumulation (not just toxicity). Or it could be modified to replace toxicity with bioaccumulation? Do we even need to run bioassays as part of monitoring since this is done on the front end (during dredged material testing) already? We now have years of site monitoring toxicity data that show no toxicity.	2	We are considering laboratory testing of on-site sediment for bioaccumulation. It is also possible that on-site bioassay testing could be tiered so that bioassays are run only if there are SL exceedances.
	We need to determine how to set the threshold for unacceptable bioaccumulation (based on risk? RB?) Won't that value then also apply to the dredged material testing program? It may be okay if it changes TTLs (which need revision anyway) but what if new sediment values are estimated from these TTLs? Wouldn't this create a new problem with regarding to parity with SMS?	2	Please see response to comment 18.
Miscellaneous			
24	Large-scale changes in dominant benthos because of climate change must be taken into account when redesigning the monitoring program. Suggest eliminating Q3 hypothesis F or at least decrease frequency of required benthic sampling.	1	The DMMP acknowledges that regional shifts in benthic community structure over time are not uncommon and that comparison of current benthic data with baseline benthic data may not be appropriate.

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