WELCOME

REGULATING BIOACCUMULATIVES IN DREDGED MATERIAL: ISSUES AND CHALLENGES

NOVEMBER 1, 2017

9AM - NOON

US Army Corps of Engineers Seattle District

DEPARTMENT OF ECOLOGY State of Washington

EPA United States Environmental Protection Agency

WASHINGTON STATE DEPT OF NATURAL RESOURCES

U.S. Army Corps of Engineers
Seattle District

DEPARTMENT OF ECOLOGY
State of Washington

WASHINGTON STATE DEPT OF NATURAL RESOURCES

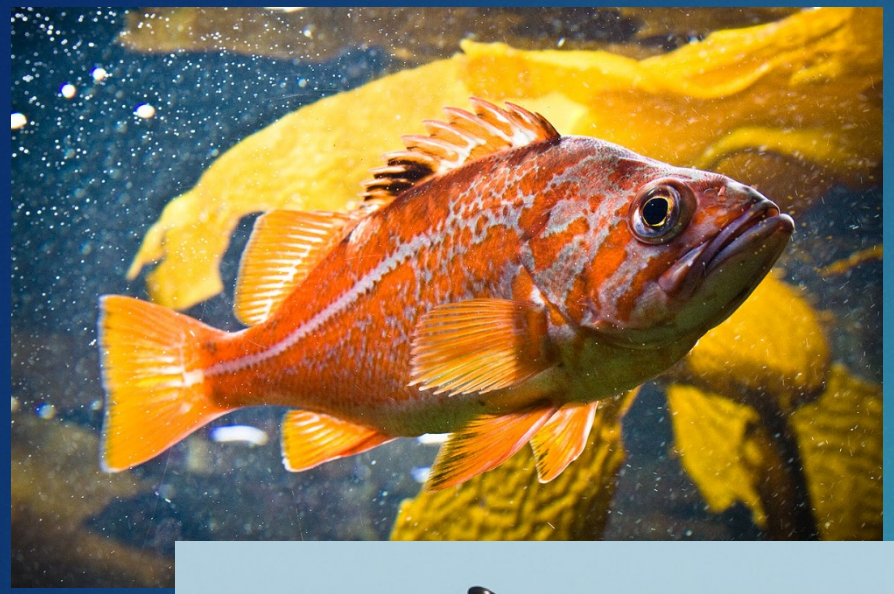
Dredged Material Management Program

Regulating Bioaccumulatives in Dredged Material: Issues and Challenges

Wednesday, November 1, 2017
9:00 am - Noon

AGENDA

9:00	Welcome	Jim Jacobson, Moderator
9:05	Introduction	Kelsey van der Elst, USACE
9:15	*Bioaccumulation Issues and Challenges* Presentation and Discussion	David Fox, USACE
10:15	Break (light snacks provided)	
10:30	*The Story Behind Site Condition II* Presentation and Discussion	Erika Hoffman, EPA
11:30	Wrap-up and next-steps	Celia Barton, DNR



Bioaccumulation Issues and Challenges

David Fox - USACE

US Army Corps of Engineers Seattle District

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Main Issues/Constraints

1. PSDDA Site Condition II – what does it mean for bioaccumulation?
2. What role does SMS Part V play?
3. ESA compliance

1. Site Condition II

Definition of Site Condition II

- Minor adverse effects
  - Some chronic sublethal effects on-site
  - Potential increase in mortality of more sensitive, but less abundant, crustacean species
  - No significant effects off-site
  - Some bioaccumulation expected on-site, but not enough to pose a human health problem

Source: PSDDA Evaluation Procedures Technical Appendix - Phase I

Site Condition II – what does it mean for bioaccumulation?

- "Some chronic sublethal effects allowed on-site"
  - Does this apply only to non-motile invertebrates? **[Yes, likely]**
  - DMMP currently tests for chronic sublethal effects with the *Neanthes* growth endpoint
  - What would we use to assess chronic sublethal effects from bioaccumulation?
    - Reproductive effects? Imposex? Population effects? **[TBD]**
    - What level of chronic sublethal effects would be allowed? **[TBD]**

Site Condition II – what does it mean for bioaccumulation?

- "Potential increase in mortality of more sensitive, but less abundant, crustacean species"
  - Refers primarily to physical impacts, but also includes impacts from contaminants
  - The PSDDA EISs acknowledge that bioaccumulation will occur on site and mortality could increase, so is there any relevance for bioaccumulation? **[Problably not]**

Site Condition II – what does it mean for bioaccumulation?

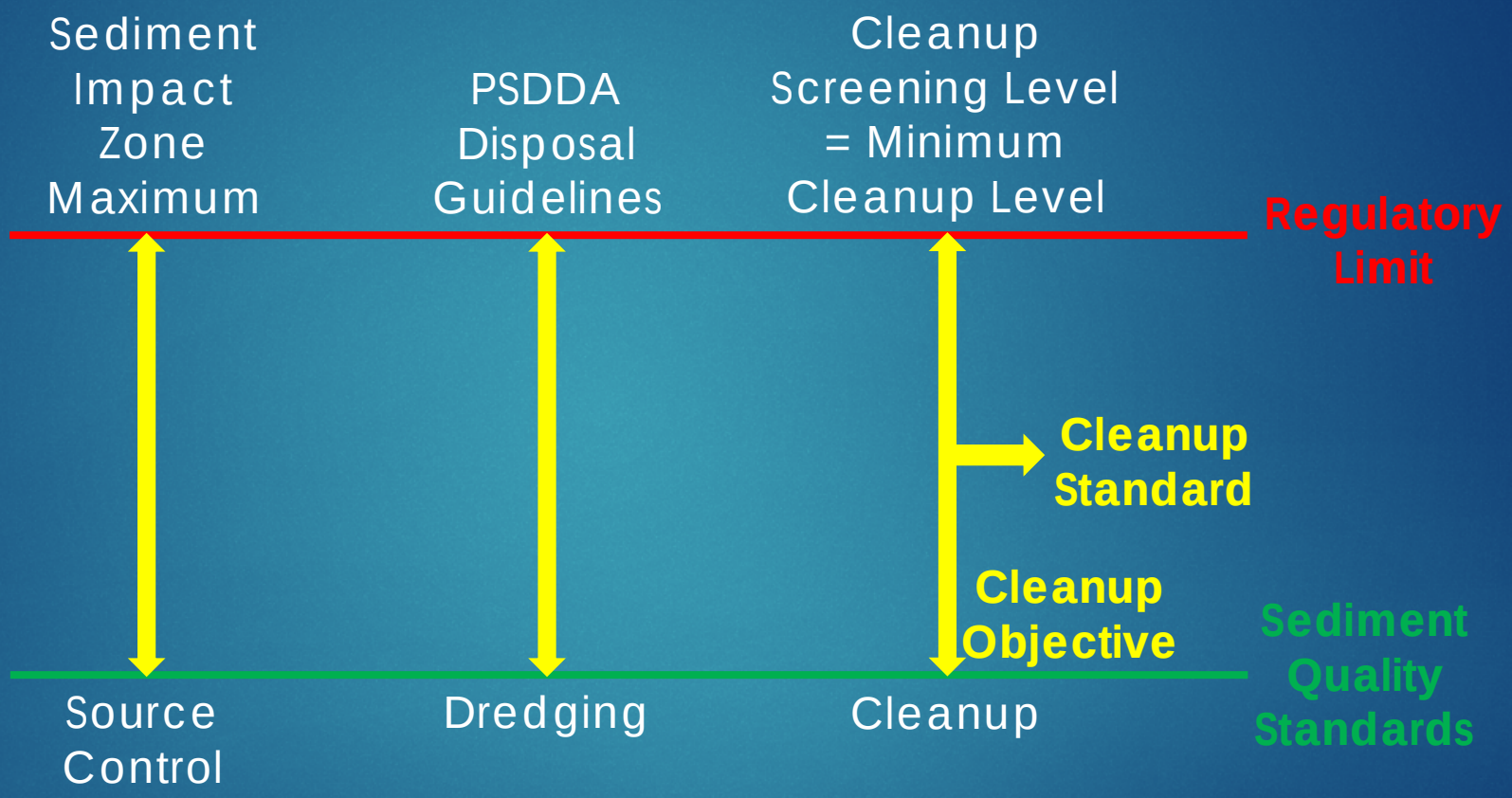
- "No significant effects off-site"
  - Includes sediment-associated contaminants moving off-site
  - Also includes crab, shrimp and benthic-feeding fish accumulating contaminants on-site, then moving off-site
  - EISs acknowledge that some chronic effects could occur to these species, as well as some transfer of contaminants to the food-web
  - What would constitute a significant effect?
    - Reduced survival, growth, reproduction, carcinogenesis, liver disease? **[TBD]**
    - How would we measure it? **[TBD]**

Site Condition II – what does it mean for bioaccumulation?

- "Some bioaccumulation expected on-site, but not enough to pose a human health problem"
  - Take a risk assessment approach? **[TBD]**
    - Consumption level associated with sites?
    - Home range of bioaccumulating species?
    - Exposure scenario?
    - Risk level – 10^{-5} or 10^{-6}?
  - Are there COCs (in addition to cPAHs) with incomplete exposure pathways? **[TBD]**

2. SMS Part V Cleanup Standards

Original Vision for “Regulatory Beauty”*



*from ARM presentation by Keith Phillips (Ecology) in May 1991

2013 SMS Rule Revision

- Part V was the only part of the rule revised in 2013
- Made SMS consistent with MTCA
- Cleanup decision framework updated to address bioaccumulatives

Applicability of Part V to DMMP

- WAC 173-204-500 Sediment cleanup decision process and policies.

(1) Applicability.

(b) This part [Part V] shall not be used in the implementation of the federal Clean Water Act...

The sediment cleanup standards and the other cleanup criteria in this part are not sediment quality standards...or sediment impact zone maximum criteria...

So why are we even considering Part V?

- Part IV called for creation of sediment impact zones for the sites, but these were not created
- Without SIZs, it's unclear how SMS applies to the DMMP sites
  - Chapter IV states that PSDDA requirements apply to dredging/disposal. So do the Standards defer to DMMP? **[Yes, to a large extent]**
  - Does the antidegradation policy apply to disposal sites? **[Yes, in the long term, but not on a project-to-project basis]**
  - Or do we simply need to keep the sites from becoming cleanup sites? **[Yes, this is certainly true]**

Cleanup Screening Levels

- If we simply need to keep disposal sites from becoming cleanup sites…
- …then the CSL becomes the upper limit for dredged material placed at the non-dispersive sites
- In Part V, the CSL is the highest of the following levels:
  - The lowest of the following risk-based levels:
    - human health
    - benthic toxicity
    - higher trophic level species
  - Regional background
  - Practical quantitation limit

CSL – human health

- carcinogenic risk level of 10^{-5}
- hazard quotient of one for non-carcinogenic chemicals
- Fish consumption rate is not included in rule; cleanup level is to be based on Reasonable Maximum Exposure; the default RME is a tribal exposure scenario

CSL – benthic community

- Chemical concentrations must be at or below established benthic CSLs

OR

- The CSL biological criteria are not exceeded

CSL – higher trophic level species

- No adverse effects
- Site-specific ecological risk assessment must be performed
  - reproduction, growth, survival
  - species life history, feeding and reproductive strategy, population numbers, home range
  - The potential for the contaminant to bioaccumulate or biomagnify through the food chain

3. ESA Compliance

ESA Consultation

- Seattle District consults with NMFS and USFWS on continued use of the multiuser disposal sites in Puget Sound and Grays Harbor
- Bioaccumulation has been an important issue in past consultations, including effects to marine mammals and rockfish

ESA – rockfish biological opinion (Biop)

- Covers all non-dispersive sites and 2 dispersive sites in Puget Sound
- Bioaccumulatives appear in rockfish from urban areas of Puget Sound, and in salmon and forage fish throughout the region
- Reproductive function and productivity are likely affected by contaminants

ESA – rockfish Biop (cont.)

- Discusses biomagnification of PCBs, dioxins and PBDEs, including in rockfish
- Discusses NMFS research evaluating sublethal effects of PAHs on fish
- States that it is likely that dredged material disposal would introduce PBDEs to benthic habitats at the sites
- States that rockfish larvae present at the disposal sites would be exposed to any bioaccumulative toxins attached to sediment
- States that exposure is likely to incidentally harm some larvae by injuring or killing them

NMFS Essential Fish Habitat (EFH) Recommendations

- Minimize potential bioaccumulation: PBDEs
  - Reduce concentrations of PBDEs in sediments disposed at sites
  - Develop PBDE guidelines and require sediment testing
- Minimize potential bioaccumulation: PAHs
  - Consider NMFS proposed sediment PAH guidelines for fish

EFH - DMMP responses

- Minimize potential bioaccumulation: PBDEs
  - Continue site monitoring of PBDEs
  - Will develop guidelines for PBDEs if warranted and as funding and staffing levels permit
- Minimize potential bioaccumulation: PAHs
  - Commitment to work with NMFS to resolve technical issues with proposed PAH screening level to protect salmonids
  - Will consider adoption of revised PAH guidelines

Challenges

- Develop guidelines that are compatible with:
  - Site Condition II
  - SMS
  - ESA consultation

Challenges

- Revise guidelines for PAHs and PCBs
- Develop BTs that are driven by bioaccumulation potential, not benthic effects
- Refine the basis of the BT for TBT
- Complete review of PBDEs and develop guidelines as necessary per our ESA commitment to NMFS

Challenges

- Modify disposal site monitoring guidelines, as necessary, to be compatible with revised bioaccumulation guidelines
- Public perception challenges: shoreline permits, tribal concerns, public acceptance
- Staff time/funding to support program modifications and guideline development

Resource Requirements

- Revisions to DMMP bioaccumulation guidelines can be divided into:
  - Issues that can be addressed with existing staff through the normal SMARM process
  - Longer-term issues that will require additional staffing or contractor support

Resource Requirements

- Use SMARM process to address low-hanging fruit with existing staff:
  - CPAH/TPAH
  - PCB TEQ
  - Basis for TBT bioaccumulation trigger

Resource Requirements

- Additional resources required for a more comprehensive revision of DMMP bioaccumulation guidelines that will address:
  - Site Condition II
  - Role of SMS rule
  - Compliance with Clean Water Act
  - ESA
  - Regulatory flexibility

Questions?