Subgroup 1 – Site Specific Standard Development

Subgroup 2 – Default Standard Development

Contaminated Sediments External Advisory Group Meeting

September 19, 2016

Summary

- Whatever approach is developed (i.e. numbers or process) it needs to:
  - Be legally defensible
  - Meet the 80/20 rule
  - Provide consistency
  - Result in reproducible numbers/process (i.e. same inputs will equal similar outputs)
  - Ensure selected numbers are achievable
- CSEAG Charter is to develop recommendations, not rules

Possible Options for Default Sediment Numbers

- **Consensus Based Sediment Quality Guidelines (CBSQG)**
  - Pro: Guidelines are still relevant based on results provided in State Comparison Table
  - Con: Guidance developed as a screening tool

- **Water Quality Basis for Default Numbers (NR 102 – NR 106)**
  - Pro: Existing process for back calculating a sediment number
  - Undetermined: Legal authority has not been evaluated
  - Con: 1) Workload concern within DNR and 2) EPA was not willing to accept a back calculation approach in the past

- **EPA Region V – Ecological Screening Levels (ESLs)**
  - Pro: 1) Takes ecological risk into consideration, 2) Similar approach being used for soil and 3) consistent with CBSQG
  - Undetermined: Legal authority has not been evaluated

Recommended Approach: EPA - Region V ESLs

- Are there any concerns with using this approach?
  - Specific Number vs. Range
  - Totals vs. Individual Parameters
  - Other?

- Is there support for this recommendation?

Note: DNR working internally to determine legal authority for outlined/recommended approaches.

Contaminant Values Comparison Table

Metals

	CBSQGs for Sediment		Soil Values From DNR RSL Spreadsheet			EPA Region 5 Ecological Screening Levels		Washington State Standards	
Constituent	TEC (mg/kg dry wt)	PEC (mg/kg dry wt)	Non-industrial (mg/kg)	Industrial (mg/kg)	Groundwater Pathway (mg/kg)	R5 Sediment ESL (mg/kg)	R5 Soil ESL (mg/kg)	SCO (mg/kg)	CLS (mg/kg)
Antimony	2	25	31.3	409	0.542		0.142		
Arsenic	9.8	3	0.613	2.39	0.584	9.79	5.7	14	120
Cadmium	0.99	5	70	799	0.752	0.99	0.00222	2.1	5.4
Chromium	43	110				43.4	0.4	72	88
Copper	32	150	3,130	40,900	91.6	31.6	5.4	400	1,200
Iron	20,000	40,000	54,800	100,000					
Lead	36	130	400	800	27	35.8	0.0537	360	>1,400
Manganese	460	1,100	1,830	22,900	39.1244				
Mercury	0.18	1.1	3.13	3.13	0.208	0.174	0.1	0.66	0.8
Nickel	23	49		19,800	13.0612	22.7	13.6	26	110
Silver	1.6	2.2	391	5,110	0.8491	0.5	4.04	0.57	1
Zinc	120	460	23,500	100,000		121	6.62	3,200	>4,200

Green shaded areas are the most protective concentrations

Contaminant Values Comparison Table - Metals

Metals		
	EPA Region 5 Ecological Screening Levels	
Constituent	R5 Sediment ESL (mg/kg)	R5 Soil ESL (mg/kg)
Antimony		0.142
Arsenic	9.79	5.7
Cadmium	0.99	0.00222
Chromium	43.4	0.4
Copper	31.6	5.4
Iron		
Lead	35.8	0.0537
Manganese		
Mercury	0.174	0.1
Nickel	22.7	13.6
Silver	0.5	4.04
Zinc	121	6.62

Contaminant Values Comparison Table – PAHs & PCBs

PAHs & PCBs		
	EPA Region 5 Ecological Screening Levels	
Constituent	R5 Sediment ESL (mg/kg)	R5 Soil ESL (mg/kg)
Acenapthene	0.00671	682
Acenaphtylene	0.00587	682
Anthracene	0.0572	1480
Fluorene	0.0774	
Naphthalene	0.176	0.0994
2-methylnaphthalene	0.0202	3.24
Phenanthrene	0.204	45.7
Benza(a)anthracene	0.108	5.21
Benzo(a)pyrene	0.15	1.52
Benzo(e)pyrene		
Benzo(b)fluoranthene	10.4	59.8
Bnezo(k)fluoranthene	0.24	148
Benzo(g,h,i)perylene	0.17	119
Chrysene	0.166	4.73
Dibenzo(a,h)anthracene	0.033	18.4
Fluoranthene	0.423	122
Indeno(1,2,3-cd)pyrene	0.2	109
Pyrene	0.195	78.5
Total PAHs	1.61	
Total PCBs	0.0598	

Contaminant Values Comparison Table - Pesticides

Pesticides, etc.		
	EPA Region 5 Ecological Screening Levels	
Constituent	R5 Sediment ESL (mg/kg)	R5 Soil ESL (mg/kg)
Aldrin	0.002	0.00332
BHC		
alpha-BHC	0.006	0.0994
beta-BHC	0.005	0.00398
gamma-BHC (lindane)	0.00237	0.005
Chlordane	0.00324	0.24
Dieldrin	0.0019	0.00238
Sum DDD	0.00488	0.758
Sum DDE	0.00316	0.596
Sum o,p' + p,p' DDT		
Sum of DDT + DDD DDE		
Endrin	0.00222	0.0101
Heptachlor Epoxide	0.00247	0.152
Mirex		
Toxaphene	0.000077	0.119

Contaminant Values Comparison Table - Other

Other Assorted		
	EPA Region 5 Ecological Screening Levels	
Constituent	R5 Sediment ESL (mg/kg)	R5 Soil ESL (mg/kg)
Benzene	0.14157	0.255
Toluene	1.22	5.45
Xylene	0.433	10
2,3,7,8-TCDD (pgTEQ/g)	0.00000012	0.00000019
Pentachlorophenol	23	0.119
Tributyltin		
1,2-dichlorobenzene	0.294	2.96
1,4-dichlorobenzene	0.318	0.546
1,2,4-trichlorobenzene	5.062	11.1
Dimethyl Phthalate		734
Diethyl Phthalate	0.295	24.8
Di-N-Butyl Phthalate	1.114	0.15
Di-N-Octyl Phthalate	4.06	709
Dibenzofuran	0.449	
Phenol	0.0491	120
2-methylphenol	0.30453	
2,4 dimethyl phenol	30453	0.01
Benzyl Alcohol	0.00104	65.8
Benzoic Acid		

What do sediment default numbers mean?

- **≤ Default Number and ≤ Background Concentration**
  - No additional assessment /action needed
  - Location tracked in DNR database

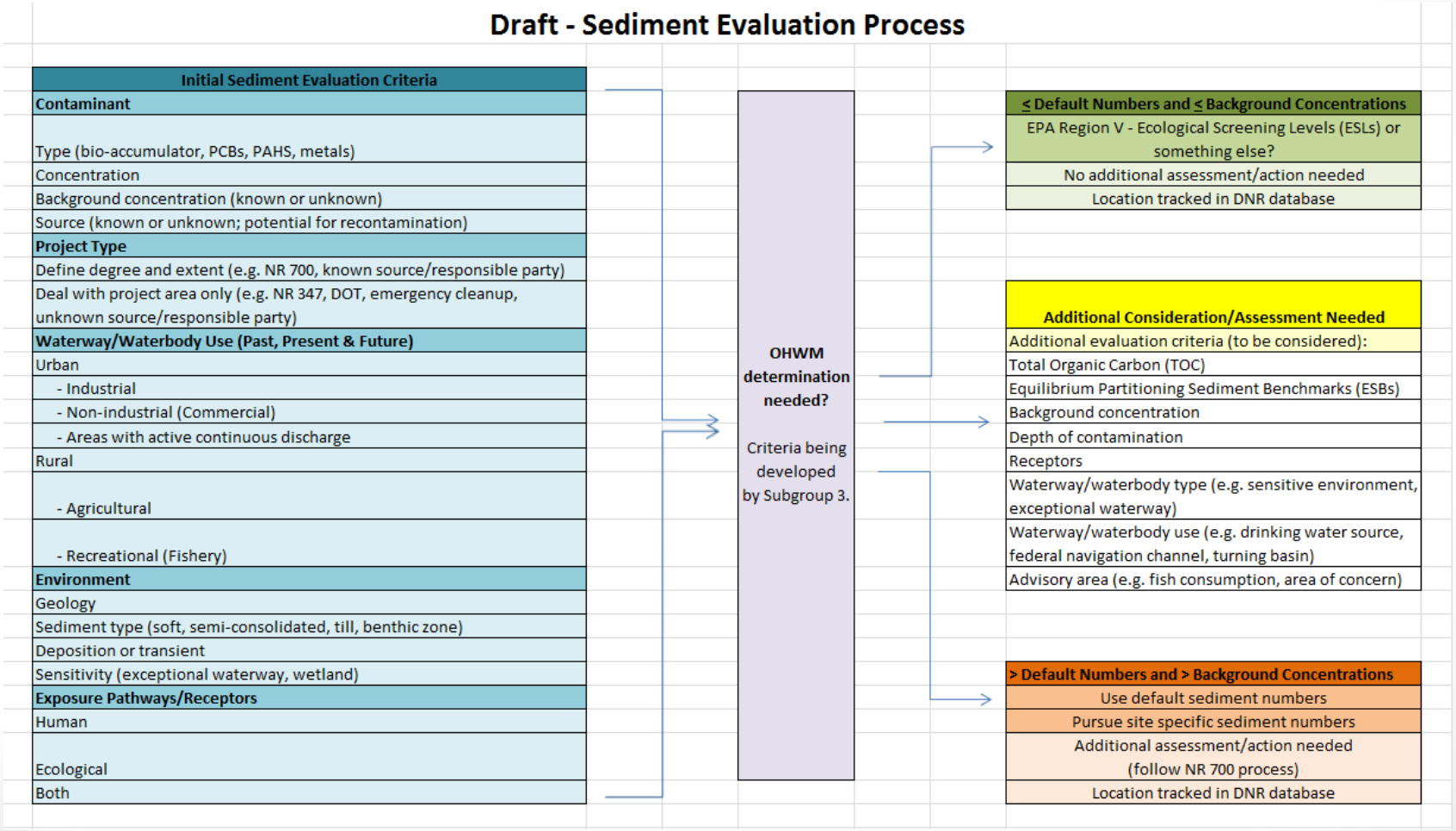
- **> Default Number and/or > Background Concentration**
  - Additional assessment needed (follow NR 700 process)
  - Use default numbers or pursue site specific numbers
  - Location tracked in DNR database

- **In Between Category: Additional Consideration/Assessment Needed**
  - Additional assessment and evaluation
  - Results lead to one of the other two categories:
    - ≤ Default Number and ≤ Background Concentration
    - > Default Number and/or > Background Concentration

Priority Factors
(in no specific order)

- Source
- Background
- Contaminant Type/Characteristics/Depth
- Waterbody
- Environment
- Project Type
- Geology
- Practicality
- Other

Sediment Evaluation Process (i.e. Factor Prioritization)



Next Steps

- End Products/Deliverables
- Volunteer Assignments
- Next Meeting for Subgroups 1 and 2
  - Proposed Dates:
    - October 24th, 12:30 – 2:30
    - November 22nd, 12:30 – 2:30
    - December 5th, 12:30 – 2:30 *or* December 13th, 12:30 – 2:30
  - Madison meeting location