DEVELOPMENT OF FRESHWATER SEDIMENT QUALITY VALUES FOR USE IN WASHINGTON STATE

PHASE I TASK 6: FINAL REPORT

APPENDICES

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APPENDIX A

Apparent Effects Thresholds

TECHNICAL APPENDICES

APPENDIX A. APPARENT EFFECTS THRESHOLDS

Data Sets

Tables A-1 to A-4 from Ecology (1997) summarize the data sets that were used in calculating the freshwater AETs and PAETs, and are reproduced in this appendix. These tables provide bibliographic references, chemical classes and biological tests included in each survey, and the overall number of stations available for each biological test, as well as the number of these stations at which adverse effects were observed. All of the data from these surveys have been entered into Ecology's Sediment Quality Information System (SEDQUAL), and hard copies of all of the reports are filed and accessible in Ecology's Environmental Assessment Program library.

In general, the surveys cover a time span from 1986 through 1994, and therefore do not include a large number of newer regional surveys that are now available using more standardized bioassay protocols. The surveys are mainly from lakes in the Seattle area or the lower Columbia River, with a few surveys from the upper Columbia River and the Willamette River in Oregon.

Nearly all the surveys include metals and a full suite of PAHs, and most include other BNA organics as well. About half the surveys include pesticides and PCBs, and only a few surveys include dioxins/furans and resin acids. On the biological side, nearly all of the surveys include the acute *Hyalella azteca* bioassay; some were 10-day and some 14-day tests. About half of the surveys also had Microtox and/or *Daphnia* tests, although the numbers of stations are much smaller than *Hyalella*. In addition, a few surveys had *Chironomus*, *Ceriodaphnia*, and/or *Hexagenia* tests. Most of these are acute endpoints, with the exception of a few *Ceriodaphnia* reproductive tests and *Chironomus* growth and emergence tests. Microtox can also be considered a sublethal or chronic test. No benthic community data were included.

Derivation Methods

Both marine and freshwater AETs are calculated according to the following procedures:

- All available synoptic chemical and biological data are entered into the database. The mean of replicate data is calculated and used to represent the overall station.

- The stations are formed into station groups by bioassay type. AETs are calculated separately for each biological test, and therefore all of the following steps are completed separately for each biological test.

- Each station is assessed to determine whether adverse effects were observed in the biological test. If adverse effects were observed, the station is placed in a "hit" distribution, and if they were not observed, the station is placed in a "no-hit" distribution.

- For each of the freshwater biological tests except Microtox, a station was assigned to the hit distribution if there was a statistically significant increase in the measured endpoint when compared to reference (clean background) stations collected with the study. Statistical significance was determined with a one-tailed t-test at $p<0.05$, if data were normally distributed, or if application of an arc-sine transform created a normal distribution. Otherwise, the Mann-Whitney test was used. For the Microtox test, a statistically significant reduction in bioluminescence of at least 20% was considered a hit, in accordance with the pre-existing endpoint for the marine Microtox AET.

- Chemical concentrations in the hit and no-hit distributions are arranged in order of increasing concentration and displayed on the same graph (Figure A-1).

- Outliers are removed from the no-hit distribution. These values are defined as any no-hit value that is more than 3 times the next-highest value. In the most recent update of the marine AETs, a statistically-based definition of an outlier was attempted to avoid the fairly arbitrary selection of the 3x rule. However, both approaches are problematic for smaller data sets such as the freshwater data set, and each has their drawbacks.

- Once outliers have been removed from the data set, the highest no-hit concentration is selected as the apparent effects threshold, or AET. Above this value, all measured concentrations are associated with adverse effects and are part of the hit distribution.

The probable AET (PAET) was proposed by the author of Ecology (1997) as an alternative to the outlier problem noted above. This approach is identical to the above, except that instead of removing outliers from the data set, this approach uses the 95th percentile of the no-hit distribution that is above the lowest hit value as the PAET. This approach typically results in somewhat lower numbers that are not as likely to be the highest no-hit value in the distribution.

Quality Assurance

A detailed discussion of quality assurance procedures for the freshwater AETs and PAETs is included in Ecology (1997), including scoring sheets for each survey assessed. Rather than conducting a quality assurance review on all data contained within all surveys, each survey was assessed according to its overall level of quality based on several considerations:

- Acceptability of analytical methods for chemistry and biological test protocols
- Description of sampling procedures available
- Accurate location information provided
- Appropriate quality control samples for chemical analyses included
- Positive and negative controls for bioassay tests included

A scoring sheet was developed and each survey received a numeric score, which was then translated into a quality assurance grade of A through F. Six out of 40 surveys were rejected based on this assessment. More rigorous quality assurance was conducted on individual data points that set the AETs, in accordance with QA1 procedures established by the Puget Sound Dredged Disposal Analysis Program (PSDDA 1989). In addition, data entry was subjected to 10% error checking of hand-entered concentration data, as well as checking units, analyte codes, and certain other database codes.

Because full QA1 or QA2 evaluations have not been conducted on all the surveys used to develop the freshwater AETs, nor have bioassay quality assurance assessments been done, it is not known to what extent this data set meets current quality assurance standards, particularly in light of the age of some of the surveys. Some of the freshwater data sets in the database have since been subjected to QA1 for other programs, particularly those in Lake Union and Lake Washington.

Reliability Assessments

Three measures of reliability were calculated for both the freshwater AETs and the PAETs in Ecology (1997):

- **Efficiency –** the percentage of adverse effects predictions that were accurate (correctly predicted hit stations divided by the total number of hit predictions). A low percentage would indicate a high false positive rate.

- **Sensitivity –** the percentage of adverse effects that were correctly predicted (correctly predicted hit stations divided by the total number of hit stations). A low percentage would indicate a high false negative rate.

- **Reliability –** overall percentage of correct predictions (correctly predicted hits plus correctly predicted no-hits over the total number of stations).

Using the method of AET calculation described above, efficiency will always be 100%, since by definition all stations above the AET value are hit stations. To better assess the ability of the AETs to accurately predict adverse effects, an iterative method of calculating AETs and assessing their efficiency was used. With this approach, a single station was dropped out of the data set, an AET calculated, and then the ability of this resulting AET to predict effects at the removed station was assessed. This approach was iterated throughout the entire data set.

The biological tests were assessed in three groups – *Hyalella*, Microtox, and a third group composed of the remaining miscellaneous bioassays. The AET developed for each group was assessed to determine its performance in predicting effects in the other bioassay groups, on both an OC-normalized and dry weight basis.

Finally, the reliability of the AETs and PAETs was compared against the reliability of other then-existing criteria, including Severe Effects Levels (Ontario), Probably Effects Levels and Threshold Effects Levels (Environment Canada), Equilibrium Partitioning (EPA), Seuil d'Effets Nefastes (Environment Canada) and the marine AETs (Washington State).

Conclusions of the reliability assessment for the two main bioassays assessed (*Hyalella* and Microtox) were as follows:

- Dry weight AETs and PAETs performed better in all measures of reliability than did organic-carbon normalized values.

- Even using an iterative approach, efficiency was 100% for both bioassays when predicting effects of the same bioassay. Sensitivity for *Hyalella* was relatively low at 42%, and sensitivity for Microtox was somewhat higher at 68%.

- When used to predict effects in other bioassays, sensitivity ranged widely from 14-86%, and efficiency ranged from 25-100%. This clearly indicates that different freshwater bioassays have widely varying sensitivities, and the selection of a low AET from a suite of AETs is needed to be protective of a natural benthic community.

- Compared with other SQV sets, the freshwater AETs and PAETs tended to have low to intermediate sensitivity, and high to intermediate efficiency, with the PAETs providing a more even and more sensitive trade-off between the two measures of reliability. Overall reliability of the AETs and PAETs was similar to or better than that of other criteria sets, but was heavily influenced by the efficiency measure.

- Replacing freshwater AETs with marine AETs for the metals appeared to improve their sensitivity, while lowering their efficiency somewhat. This approach was recommended by the authors of this report. Developing freshwater criteria for metals may be somewhat confounded by the wider variety of geochemical environments and resulting bioavailability than occurs in marine systems.

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Information on the regulatory history and technical background of AETs

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References

Ecology. July 1997. Creation and Analysis of Freshwater Sediment Quality Values in Washington State. Pub. No. 97-323a. Washington Department of Ecology, Environmental Investigations and Laboratory Services Program, Olympia, WA.

Additional references on marine AETs:

PSDDA. April 1996. Progress Re-Evaluating Puget Sound Apparent Effects Thresholds (AETs), Volume I: 1994 Amphipod and Echinoderm Larval AETs. Draft Report. Puget Sound Dredged Disposal Analysis, Seattle, WA.

PSEP. September 1988. Sediment Quality Values Refinement: Volume I, 1988 Update and Evaluation of Puget Sound AET. Puget Sound Estuary Program, US EPA Region 10, Seattle, WA.

Table A-1. Summary of Sediment Investigations Used to Derive Sediment Values. (from Ecology 1997).

FSEDQUAL SURVEY	FULL TITLE	DATE	AUTHORS/AGENCY
LOWER COLUMBIA REGION			
ALCOA90	ALCOA (Aluminum Company of America) - Class 2 Inspection	1990	Zinner/Ecology
CBSLOUGH	Columbia Slough Sediment Analysis and Remediation Project	1991	Dames & Moore
COLALU93	Columbia Aluminum Co. Goldendale, Washington Baseline Sediment ...	1994	ENSR
KALAMA	Kalama Chemical Company - Class 2 Inspection	1989	Heffner/Ecology
LCBWRS93	Lower Columbia River Bi-State Program -- Backwater Reconnaissance Study	1993	Tetra Tech
LWRCOLUM	Screening Survey for Chemical Contaminants and Toxicity in Sediments at Five ...	1988	Johnson & Norton/Ecology
LNVIEW90	Longview Fibre Company - Class 2 Inspection	1991	Das/Ecology
REYNOLDS	Reynolds Aluminum Company - Class 2 Inspection	1990	Heffner/Ecology
VALCOA93	ALCOA Vancouver Works	1994	ENSR
WEYLONG	Weyerhaeuser - Longview Pulp and Paper Mill - Class 2 Inspection	1991	Andreasson/Ecology
PUGET SOUND REGION			
CEDARRIV	Cedar River Delta Sediment Sampling and Analysis	1992	Golder Associates
EVERTSM94	Site Investigation Report - Everett Simpson Site	1994	PTI
FERNDALE	Ferndale Wastewater Treatment Plant - Class 2 Inspection	1989	Ruiz/Ecology
GWPLKUN	App. of Triad Approach to Freshwater Sediment Assessment: GWP	1986	Yake et al./Ecology
HANSVL91	Site Hazard Assessment Report -- Hansville Landfill -- Kitsap County, Wa	1991	SAIC
LKUNDRDK	Sediment Monitoring Program - Lake Union Drydock Company	1992	Hart-Crowser
LKUNION	Survey of Contaminants in Sediments in Lake Union	1992	Cubbage/Ecology
MARCO90	Marco Shipyard Sediment Monitoring	1990	Friedman & Bruya
MILLCRP2	Mill Creek and East Drain Sediment Sampling and Analysis Report	1993	Landau Associates
PAINEFLD	Survey for Chemical Contaminants at Paine Field	1987	Johnson & Norton/Ecology
QUEBAX1	Distribution of PAH's in Lake Washington (Quendall Terminals/J.H.B. Site)	1991	Norton/Ecology
QUEBAX2	Effects of PAH's in Sediments of Lake Washington - Phase 2	1992	Cubbage & Bennet/Ecology
QUEBAX3	Effects of PAH's in Sediments of Lake Washington - Phase 3	1992	Norton/Ecology
SEACOM94	Sediment Sampling Report - Seattle Commons Parcel C -- Seattle, Wa	1994	Shannon & Wilson, Inc.
STEILLK2	Copper in Sediments of Steilacoom Lake	1992	Bennet & Cubbage/Ecology
UNIMAR2	Environmental Sampling - UNIMAR Yard 1 Drydock Facility - Phase 2	1991	Geo Engineers, Fishpro
UPPER COLUMBIA RIVER REGION			
BOISECAS	Boise Cascade Mill - Class 2 Inspection	1993	Johnson & Heffner/Ecology
COLBSN92	Bulk Sediment Toxicity Tests of Selected Sites w/in Columbia Basin Irr...	1993	US Fish & Wildlife, USGS
LAKEROOS	Review of Metals, Bioassay, and Macroinvertabrate data in Lake Roosevelt	1991	Johnson/Ecology
LAKEROOS92	Sediment-Quality Assessment of Franklin D. Roosevelt Lake, Washington	1994	Bortleson et al, USGS
ROOSVMET	An Assessment of Metals Contamination in Lake Roosevelt	1989	Johnson et al./Ecology
SPOKNR94	Spokane River PCB Bioassay Study -- 1994	1994	Ecology
WILLAMETTE RIVER REGION			
MBCREOS1	McCormick and Baxter Creosoting Remedial Investigation - Phase 1	1992	PTI
MBCREOS2	McCormick and Baxter Creosoting Remedial Investigation - Phase 2	1992	PTI

Table A-2. Summary of Chemistry Analyses Done by Survey. (from Ecology 1997)

FSEDQUAL SURVEY	LOCATION	Metals	PAH's	Other Organics	Pesticides PCBs	Dioxins Furans	Resin Acids	ECOLOGY ID
LOWER COLUMBIA REGION								
ALCOA90	Columbia R. @ Vancouver	+	+	+	+	-	-	SY25
CBSLOUGH	Columbia Slough	+	+	+	+	-	-	SY2
COLALU93	Columbia River Near Goldendale,	+	+	-	-	-	-	SY34
KALAMA	Columbia R. @ Longview	+	+	+	+	-	-	SY20
LCBWRS93	Lower Columbia River	+	+	+	+	+	-	SY36
LWRCOLUM	Lower Columbia River Ports	+	+	+	+	+	+	SY4
LNVIEW90	Columbia R. @ Longview	+	+	+	+	+	+	SY24
REYNOLDS	Columbia R. @ Longview	+	+	+	+	-	-	SY18
VALCOA93	Lower Columbia River	+	+	+	+	-	-	SY33
WEYLONG	Columbia R. @ Longview	+	+	+	+	-	-	SY19
PUGET SOUND REGION								
CEDARRIV	Lake Washington	+	+	+	+	-	-	SY9
EVERTSM94	Snohomish River	+	-	-	+	-	-	SY40
FERNDALE	Nooksack River	+	+	+	+	-	-	SY17
GWPLKUN	Lake Union	+	+	-	-	-	-	SY23
HANSVL91	Kitsap County	+	-	+	+	-	-	SY30
LKUNDRDK	Lake Union	+	+	+	+	-	-	SY16
LKUNION	Lake Union	+	+	+	+	-	-	SY5
MARCO90	Lake Union	+	+	+	-	-	-	SY21
MILLCRP2	Mill Creek	+	+	+	-	-	-	SY8
PAINEFLD	Paine Field	+	+	-	-	-	-	SY6
QUEBAX1	Lake Washington	+	+	+	-	-	-	SY14
QUEBAX2	Lake Washington	-	+	+	-	-	-	SY15
QUEBAX3	Lake Washington	-	+	+	-	-	-	SY22
SEACOM94	Lake Union	+	+	+	+	-	-	SY31
STEILLK2	Steilacoom Lake	+	-	-	-	-	-	SY13
UNIMAR2	Lake Union	+	+	-	-	-	-	SY26
UPPER COLUMBIA RIVER REGION								
BOISECAS	Lake Wallula	+	-	+	+	+	+	SY12
COLBSN92	Assorted irrigation returns	+	+	-	-	-	-	SY37
LAKEROOS	Lake Roosevelt	+	-	-	-	-	-	SY10
LAKEROOS92	Lake Roosevelt	+	+	-	-	-	-	SY32
ROOSVMET	Lake Roosevelt	+	-	-	-	-	-	SY7
SPOKNR94	Spokane River	+	+	+	+	-	-	SY38
WILLAMETTE RIVER REGION								
MBCREOS1	Willamette River	+	+	+	+	+	-	SY1
MBCREOS2	Willamette River	+	+	+	+	+	-	SY1
TOTAL		32	28	24	20	6	3	

+ analysis conducted

- analysis not conducted

Note: Analyses may not have been performed on all samples taken within a survey, especially for surveys with large numbers of samples

Table A-3. Review of Bioassays by Survey, Region, and Organism. (from Ecology 1997)

FSEDQUAL SURVEY	LOCATION	Total Stns	*HYALELLA*		MICROTOX		*DAPHNIA*		*CHIRON.*		*CERIODAPH.*		*HEXAGEN.*	
			Hits	Stns	Hits	Stns	Hits	Stns	Hits	Stns	Hits	Stns	Hits	Stns
	LOWER COLUMBIA REGION													
ALCOA90	Columbia R. @ Vancouver	1	0	1										
CBSLOUGH	Columbia Slough	20	0	20										
COLALU93	Columbia River Near Goldendale, WA	6	1	6	3	6								
KALAMA88	Columbia R. @ Longview	3	0	3										
LCBWRS93	Lower Columbia River	13	0	13										
LWRCOLUM	Lower Columbia River Ports	12					0	12						
LNVIEW90	Columbia R. @ Longview	3	0	3	0	3								
REYNOLDS	Columbia R. @ Longview	3	0	3	0	3								
VALCOA93	Lower Columbia River	6	2	6										
WEYLONG	Columbia R. @ Longview	3	0	3	0	3								
	REGION SUBTOTAL	**70**	**3**	**58**	**3**	**15**	**0**	**12**	**0**	**0**	**0**	**0**	**0**	**0**
	PUGET SOUND REGION													
CEDARRIV	Lake Washington	5	5	5	0	5	0	5						
EVERTSM94	Snohomish River	4	0	4					1	4				
FERNDALE	Nooksack River	3	0	3										
GWPLKUN	Lake Union	1	1	1										
HANSVL91	Kitsap County	1	0	1										
LKUNDRDK	Lake Union	4	3	4										
LKUNION	Lake Union	9	2	9	8	9	1	9						
MARCO90	Lake Union	1	0	1										
MILLCRP2	Mill Creek	19	3	19					7	19				
PAINEFLD	Paine Field	5	0	5										
QUEBAX1	Lake Washington	4	1	4			0	4						
QUEBAX2	Lake Washington	4	3	4	3	4	0	4	1	4	0	4	0	4
QUEBAX3	Lake Washington	3	1	3	1	3								
SEACOM94	Lake Union	3	1	3	2	3								
STEILLK2	Steilacoom Lake	4	2	4	0	4	0	4	0	4	1	4	1	4
UNIMAR2	Lake Union	9	7	9										
	REGION SUBTOTAL	**79**	**29**	**79**	**14**	**28**	**1**	**26**	**9**	**31**	**1**	**8**	**1**	**8**
	UPPER COLUMBIA RIVER REGION													
BOISECAS	Lake Wallula	4	3	4	0	4								
COLBSN92	Assorted irrigation returns	5							0	5				
LAKEROOS	Lake Roosevelt	5	1	5	3	5	2	5						
LAKEROOS92	Lake Roosevelt	18	4	18							8	18		
ROOSVMET	Lake Roosevelt	2	0	2			0	2						
SPOKNR94	Spokane River	2	0	2	1	2								
	REGION SUBTOTAL	**36**	**8**	**31**	**4**	**11**	**2**	**7**	**0**	**5**	**8**	**18**	**0**	**0**
	WILLAMETTE RIVER REGION													
MBCREOS1	Willamette River	53	8	53										
MBCREOS2	Willamette River	7	2	7	3	6								
	REGION SUBTOTAL	**60**	**10**	**60**	**3**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ALL REGIONS	**245**	**50**	**228**	**24**	**60**	**3**	**45**	**9**	**36**	**9**	**26**	**1**	**8**

Hits = # of stations with statistically significant effects in bioassays

Stns = # of stations with bioassay testing

Table A-4. Bioassays in Freshwater Sediment Quality Database. (from Ecology 1997)

Bioassay	Endpoint	Stations	"Hits"*
Hyalella azteca	mortality	228	50
Microtox®	luminescence reduction	60	24
Miscellaneous	(see below)	91	22
Ceriodaphnia dubia	mortality	8	1
Ceriodaphnia dubia	reproduction	26	9
Chironomus tentans	mortality	31	8
Chironomus tentans	growth	9	1
Chironomus tentans	emergence	8	1
Daphnia magna	mortality	43	3
Daphnia pulex	mortality	2	0
Hexagenia limbata	mortality	8	1

* Statistically significant biological effects
Some stations had more than one type of endpoint for Ceriodaphnia and Chironomus.

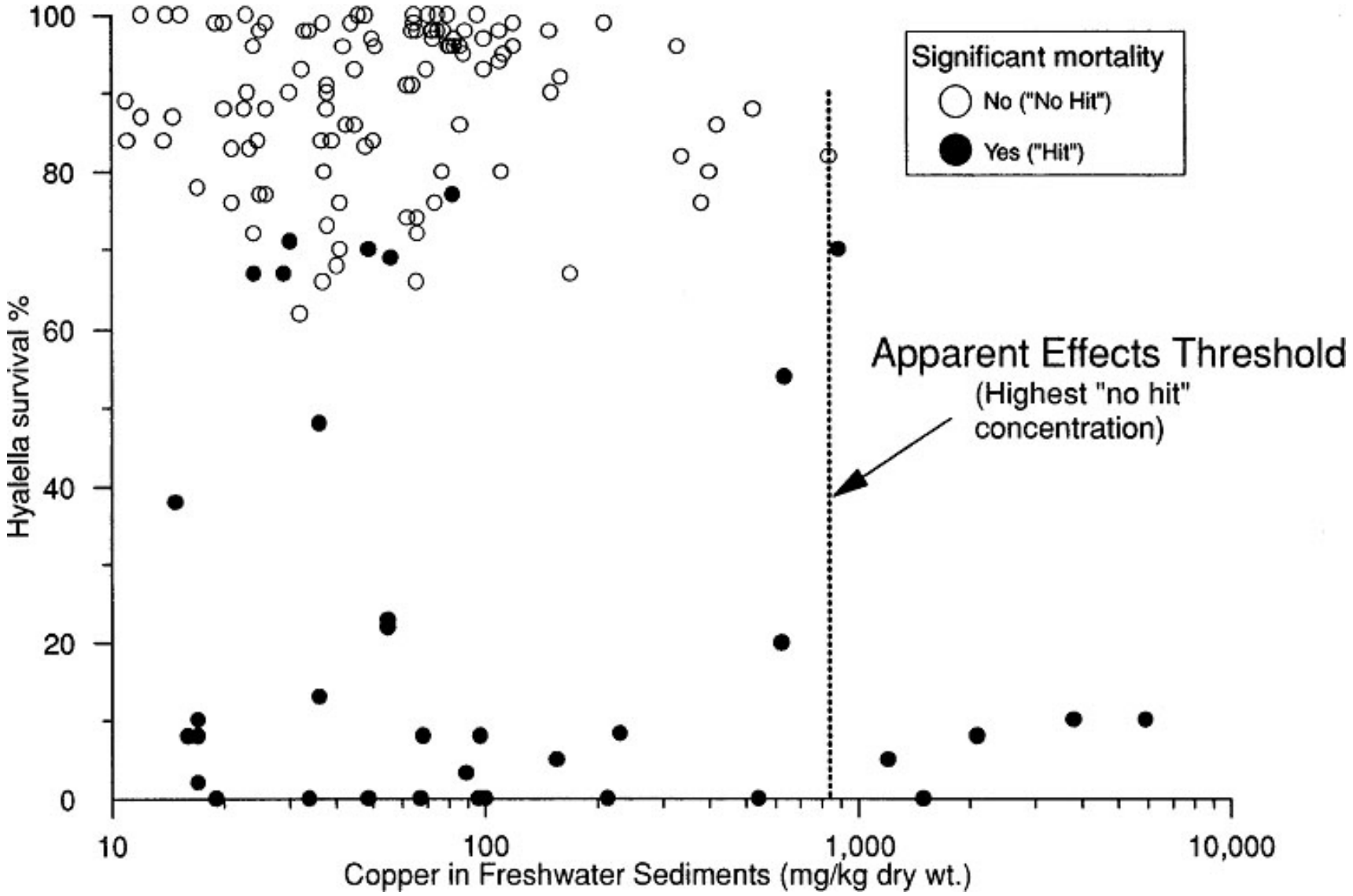

Figure A-1. Calculation of Apparent Effects Thresholds

APPENDIX B

No-Effects Concentrations

APPENDIX B. NO-EFFECTS CONCENTRATIONS

Data Sets

Table B-1 shows the data sets and associated bioassay types used to calculate NECs. In some cases, the protocols varied slightly in the number of days the test was run. All data were collected between 1987 and 1991, and the length of the bioassay protocols had yet to be finalized. Tests of different lengths were combined as follows:

- 10-day and 14-day *Hyalella azteca* tests
- 28-day, 29-day, and 32-day *Hyalella azteca* tests
- 13-day and 14-day *Chironomus riparius* tests

Derivation Methods

Derivation methods generally followed the methods used to derive AETs, described in Appendix A. However, some additional screening steps were used to screen out both entire data sets and individual data points prior to calculating the NEC, as described below:

- Data sets were assessed to determine whether there was at least a 10-fold difference among the measured chemical concentrations for the samples for at least one chemical in the data set. Data sets that did not meet this criterion were not included.

- Individual chemical concentrations in toxic samples were compared to the mean of non-toxic samples to determine whether they were higher or lower than the mean. If they were higher, the chemical concentrations were considered to be "concordant" with the toxicity observed, and were placed in the "effects" data distribution. If the chemical concentration was equal to or lower than the no-effects mean, it was considered to be "non-concordant" and was included in the "no-effects" data distribution.

- NECs were only reported for a chemical if there were at least five or more toxic samples for that chemical and the number of toxic samples above the calculated NEC was greater than the number below the calculated NEC.

The relatively small size of the data set and the additional screening conducted above resulted in fewer data points for many chemicals than what is generally considered the minimum for AETs (30-50), as well as fewer chemicals for which NECs could be derived.

The only other difference between the NECs and the AETs is that the biological test results were compared to a control sample for identifying adverse effects rather than a reference sample.

Quality Assurance

Quality assurance on chemistry samples met or exceeded standard EPA protocols and in many cases analyses were conducted by the laboratories that originally developed the EPA protocols. An independent quality assurance review of the ARCS (Great Lakes AOCs) subset of the database was commissioned by GLNPO and no significant problems were found, although typical data qualifiers were added. This independent review was conducted on approximately half the samples.

Although some of the surveys included in the database were conducted prior to the formalization of ASTM bioassay protocols, these surveys were part of the group of surveys used to develop the 1990 ASTM protocols and are consistent with them. Extensive documentation of both the chemistry and bioassay quality control and quality assurance methods exist somewhere in GLNPO files, but may not be easily accessible ten years later.

Reliability Assessments

A comprehensive reliability assessment of this and other SQVs calculated by GLNPO was provided in GLNPO (1996). Once the NECs were calculated, three assessments were conducted: 1) reliability of the NECs for correctly classifying the toxicity of samples within the data set used to calculate the NECs, 2) reliability of the NECs for predicting toxicity in independent data sets, and 3) similarity to other published SQVs. NECs were calculated and assessed using both dry weight forms and using organic carbon-normalized values for PAHs and PCBs.

Reliability for classifying samples within the data set was assessed by dividing the samples into four groups:

- Correctly classified as toxic
- Correctly classified as non-toxic
- Incorrectly classified as toxic (false positive)
- Incorrectly classified as non-toxic (false negative)

Results of the reliability assessment are as follows:

- Dry weight NECs were similar to or slightly more reliable than organic carbon-normalized NECs.

- NECs had 70-80% overall reliability, equal to or greater than other SQVs assessed in the same report. However, this was heavily influenced by the fact that there were many more non-toxic samples than toxic samples in the data set.

- NECs had 0-5% false positives, lower than the other SQVs assessed.

- NECs had 20-40% false negatives, higher than the other SQVs assessed.

- NECs for the Great Lakes alone were more conservative than NECs calculated using the broader data set. This was attributed to the methods used to calculate AETs/NECs, in which the SQV can only increase when additional data are included in the data set.

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APPENDIX C

Effects Range Low
And
Effects Range Median

References

GLNPO. 1996. Calculation and evaluation of sediment effect concentrations for the amphipod *Hyalella azteca* and the midge *Chironomus riparius*. Great Lakes National Program Office, EPA Region 5, Chicago IL. EPA 905-R96-008.

Ingersoll, C.G., P.S. Haverland, E.L. Brunson, T.J. Canfield, F.J. Dwyer, C.E. Henke, N.E. Kemble, D.R. Mount, R.G. Fox. 1996. Calculation and evaluation of sediment effect concentrations for the amphipod *Hyalella azteca* and the midge *Chironomus riparius*. *J. Great Lakes Res.* 22(3):602-623.

Table B-1. Data sets and associated bioassay types used to calculate NECs

		Number of Stations		
Location	**Year**	***H. azteca* 14-day**	***H. azteca* 28-day**	***C. riparius* 14-day**
Indiana Harbor	1989	8	8	8
Buffalo River	1989	11	11	11
Saginaw River	1989/1990	24	24	24
Waukegan Harbor	1987	4	4	4
Mississippi River	1987	0	5	0
Clark Fork River	1991	0	15	15
Trinity River	1988	5	5	0
Mobile Bay	1988	0	6	0
Galveston Bay	1990	0	5	0
TOTAL		**32**	**83**	**62**

APPENDIX C. EFFECTS RANGE LOW AND EFFECTS RANGE MEDIAN

Data Sets

The data sets GLNPO used to calculate ERLs and ERMs are the same as those described in Appendix B for NECs. However, unlike NECs, only the data from stations with adverse effects are used in calculating ERLs and ERMs. Table C-1 from GLNPO (1996) shows the number of stations that were toxic in each data set and for each biological test.

Derivation Methods

The following steps were used to calculate ERLs and ERMs:

- Data sets and individual data points were screened as described in Appendix B.
- Data were sorted into no-effects and effects data distributions (including evaluation of concordance with toxicity results), in order of increasing concentration.
- The 15^{th} percentile of the effects distribution was chosen as the ERL, and the 50^{th} percentile of the effects distribution was chosen as the ERM.

Although NOAA originally used the 10^{th} percentile to calculate ERLs for marine sediments, GLNPO chose to use the 15^{th} percentile to reduce the frequency of Type II errors.

Quality Assurance

Quality assurance methods were the same as those described for NECs in Appendix B.

Reliability Assessments

The reliability assessment for ERLs/ERMs was conducted in the same manner described for NECs in Appendix B. The results of the reliability assessment included:

- Dry weight ERMs were similar to or slightly more conservative than organic carbon-normalized ERMs. Dry weight ERLs had a more variable relationship with organic carbon-normalized ERLs.
- ERMs had 70-80% overall reliability, similar to NECs. ERLs for different biological tests ranged from 30-80% reliability, but were generally somewhat lower than ERMs or NECs, due to a higher false positive rate.
- ERMs had 5-30% false positives, while ERLs had 20-70% false positives.
- ERMs had 5-20% false negatives, while ERLs had 0-10% false negatives.
- There was no consistent relationship between ERLs/ERMs calculated for the Great Lakes vs. those calculated using the larger data set. Although similar, they could sometimes be higher and sometimes lower than the Great Lakes-only values.

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Table C-1. Percentage of sediment samples identified as toxic for each biological test and survey.

	TOXIC[1]	TOXIC-S[2]	TOXIC-G[3]	TOXIC-M[4]
All samples				
CR14	26 (42)	24 (42)	9 (34)	ND
HA14	41 (32)	25 (32)	20 (25)	24 (21)
HA28	39 (62)	26 (62)	34 (44)	11 (36)
Great Lakes				
CR14	37 (27)	33 (27)	11 (19)	ND
HA14	48 (27)	30 (27)	20 (25)	24 (21)
HA28	48 (27)	41 (27)	24 (25)	5 (21)
Upper Mississippi River				
HA28	0 (5)	0 (5)	ND	ND
Clark Fork River				
CR14	7 (15)	7 (15)	7 (15)	ND
HA28	53 (15)	13 (15)	53 (15)	20 (15)
Trinity River				
HA14	0 (5)	0 (5)	ND	ND
HA28	0 (5)	0 (5)	ND	ND
Mobile Bay				
HA28	0 (5)	0 (5)	ND	ND
Galveston Bay				
HA28	60 (5)	60 (4)	25 (4)	ND

[1]TOXIC: Significant reduction in survival, growth, or maturation relative to the control ($p<0.05$, N in parentheses)
[2]TOXIC-S: Significant reduction in survival
[3]TOXIC-G: Significant reduction in growth
[4]TOXIC-M: Significant reduction in maturation (H. azteca only)
[5]ND: Not determined

APPENDIX D

Threshold Effects Levels
And
Probable Effects Levels

APPENDIX D. THRESHOLD EFFECTS LEVELS AND PROBABLE EFFECTS LEVELS

Data Sets

Fifty-six separate studies contained synoptic chemical and biological data and were included in the database, of which approximately 35% were from the Great Lakes region and the rest from other areas of the US and Canada. No single list of all the studies entered into the database is available, although lists of the studies used to derive TELs/PELs for each chemical can be found in Environment Canada's chemical-specific sediment quality guideline documents. Under this approach, each study or related group of stations is averaged to obtain an effects or no-effects concentration (see below). The total number of effects and no-effects concentrations used to calculate the TELs/PELs varies greatly by chemical, ranging from 21-116 for the effects distribution and 25-384 for the no-effects distribution (chemicals were not included if there were fewer than 20 concentration values). Metals tended to have the greatest number of data points, followed by PCBs, PAHs, and lastly pesticides. There were approximately 5 times as many no-effects concentrations as there were effects concentrations.

Derivation Methods

The derivation of TELs/PELs followed the steps below:

- Data sets were screened for acceptability prior to entry into the database (see below)
- Stations within each data set were divided into toxic and non-toxic groups
- The mean toxic concentration and the mean non-toxic concentration were calculated and compared to determine whether they were statistically different. In addition, if the mean toxic concentration was at least twice the mean non-toxic concentration, then the mean toxic concentration was included in the effects distribution. If not, it was considered to be "non-concordant" with biological toxicity and was included in the no-effects distribution along with the mean non-toxic concentration.
- This procedure resulted in a distribution of effects and no-effects data points, each of which represented the mean of several stations. These distributions were placed in ascending order of concentration. If there were fewer than 20 data points in either the effects or the no-effects distribution, a TEL/PEL was not calculated.
- TELs were calculated as the geometric mean of the 15^{th} percentile of the effects distribution and the 50^{th} percentile of the no-effects distribution.
- PELs were calculated as the geometric mean of the 50^{th} percentile of the effects distribution and the 85^{th} percentile of the no-effects distribution.

An example of the derivation method is shown in Figure D-1.

Quality Assurance

A qualitative quality assurance review was performed on the data sets entered into the database. A checklist was used to assess a variety of factors, including ensuring that data were synoptic, that sampling protocols were adequate, appropriate analytical and bioassay protocols were followed, controls or references were used, statistical procedures reported, and no evidence of significant quality assurance problems appeared in the data reports. Original data were not reviewed. Instead, the project team relied

on the quality assurance reviews conducted by the original authors, in some cases contacting the author to verify what was done. Bioassays were verified to be consistent with ASTM protocols in use at the time (early 90's).

Reliability Assessments

The reliability assessments conducted for the TELs and PELs differ from those described above, in that the TELs were assessed only for their ability to predict a lack of effects below that level, and the PELs were assessed only for their ability to predict effects above that level. Results of this assessment are as follows:

- False negative rates for the TELs range from 0-16% for individual chemicals. The average false negative rate was 6%. Based on the assessment below, the false positive rate for the TELs would be expected to be well over 60%.

- False positive rates for the PELs are much more variable, ranging from to 15% for DDD to 88% for arsenic. The average false positive rate was 54%. Based on the assessment above, the false negative rate for PELs would be expected to be higher than 10%, but the actual rate would differ greatly for different chemicals.

- From these rates the authors concluded that the TELs are more reliable than the PELs, for their respective intended purposes. However, for metals, the authors concluded that the PELs were similar to several other SQVs available in the literature and could therefore be considered reliable. PELs for PAHs and pesticides were less comparable to other values.

It should be kept in mind that these reliability assessments were conducted for individual chemicals, an approach which may not be mathematically valid. This approach contains an inherent assumption that all the toxicity observed is associated with the chemical being assessed, which is not the case. The true reliability rates if the entire SQV set were evaluated against the biological data would likely have even lower false negative rates and higher false positive rates, since the exceedance of any one SQV would predict a hit.

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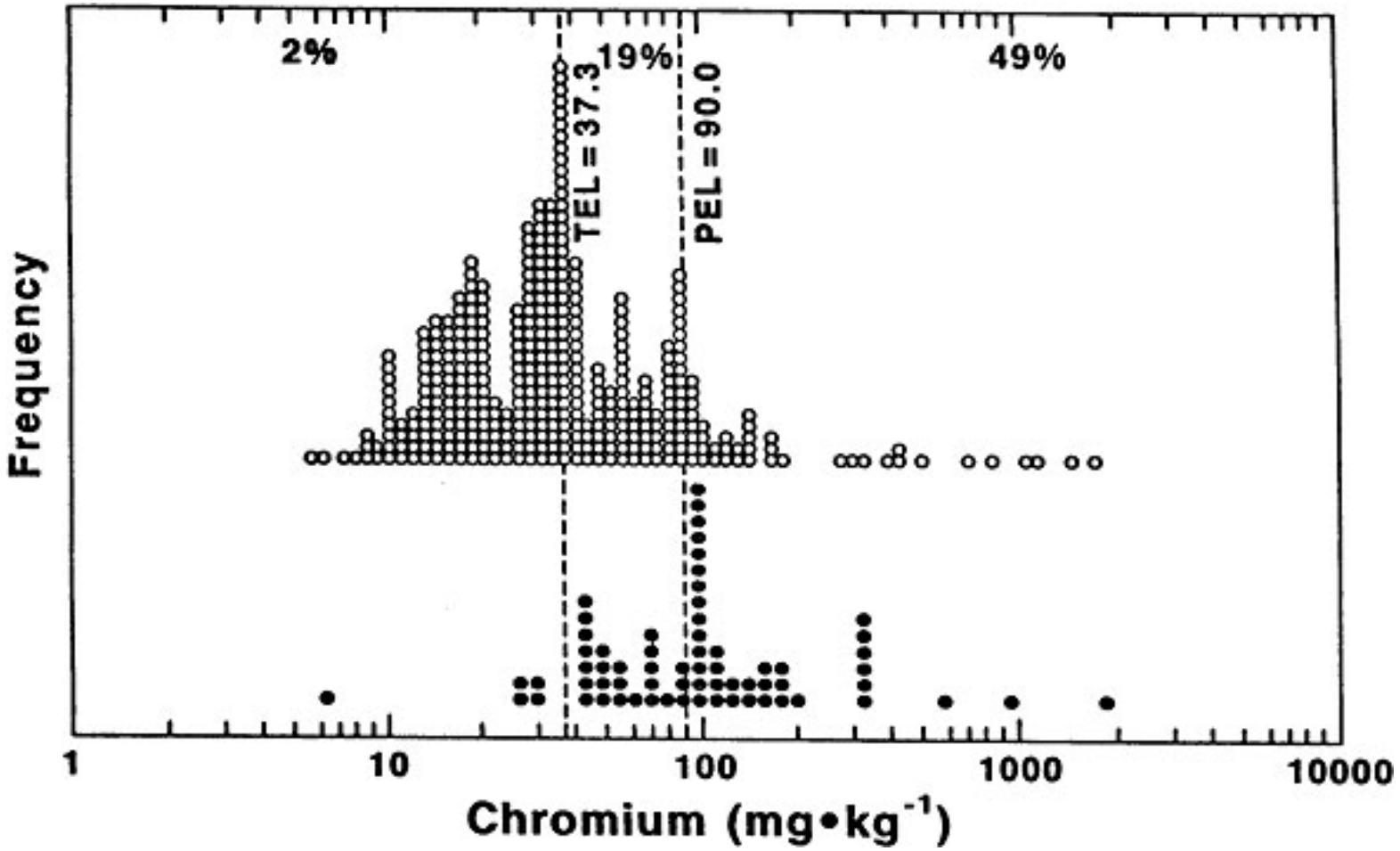

Figure D-1. Derivation of Freshwater TELs and PELs for Chromium

APPENDIX E

Consensus-Based
Sediment Quality Guidelines

APPENDIX E. CONSENSUS-BASED SEDIMENT QUALITY GUIDELINES

Data Sets

Consensus-based sediment quality guidelines were derived from a group of existing freshwater SQV sets, which included:

- Ontario LELs/SELs
- TELs/PELs (both EC and GLNPO versions)
- ERLs/ERMs
- Quebec METs/TETs
- Chronic EqP values

The underlying data sets for each of these SQV sets are discussed in their respective appendices.

Derivation Methods

Consensus-based sediment quality guidelines were derived using the following steps:

- Freshwater SQV sets from North America were gathered and screened against several criteria: 1) the methods used to derive the SQVs were readily apparent, 2) the SQVs were based on the protection of benthic organisms, and 3) the SQVs had been independently derived and were not adopted from another jurisdiction.

- The SQV sets passing the screening were divided into low and high groups – the low group consisted of the LELs, TELs, ERLs, METs, and chronic EqP values, while the high group consisted of the SELs, PELs, ERMs, and TETs.

- If three or more published values were available for a chemical or group of chemicals, consensus-based guidelines were calculated.

- Threshold effects concentrations (TECs) were calculated as the geometric mean of the lower group of SQVs, and probable effects concentrations were calculated as the geometric mean of the higher group of SQVs.

Quality Assurance

No additional quality assurance was conducted on these SQV sets beyond those conducted by the original SQV developers.

Reliability Assessments

Reliability assessments were conducted similarly to those described for the TELs and PELs above. For TECs, the assessment was of the ability of these values to predict an absence of effects below this level, while for PECs, the assessment was of the ability of these values to predict adverse effects above this level. Results of this reliability assessment are as follows:

- False negatives for the TECs ranged from 11-29% for all but one chemical (mercury at 66%).

- False positives for the PECs ranged from 0-27% for all but one chemical (heptachlor epoxide at 62%).

In addition, the predictive ability of the mean PEC quotient was assessed against the toxicity observed in various freshwater biological tests, including acute and chronic *Hyalella azteca* bioassays and acute *Chironomus* sp. bioassays. The results of this assessment are as follows:

- The mean PEC quotient exhibits a clear dose-response relationship with the results of all three bioassays, with r^2 values for the three bioassays ranging from 0.74 to 0.80.

- The reliability of the mean PEC quotients calculated using the PEC for total PAHs was statistically indistinguishable from the reliability of mean PEC quotients calculated using PECs for individual PAHs.

- Chronic effects begin to be observed at mean PEC quotients of 0.5, while acute effects are observed at PEC quotients approximately 6 times higher.

Based on this assessment, the authors concluded that a true dose-response relationship exists, supporting their contention that the consensus-based guidelines exhibit causal, rather than merely correlative, relationships with toxicity. To further support this claim, the authors note that the PECs are generally within a factor of three of EqP SQVs.

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APPENDIX F

Ontario Screening Level Concentrations

APPENDIX F. ONTARIO SCREENING LEVEL CONCENTRATIONS

Data Sets

The data set used for the SLC calculations is not summarized in any of the criteria development reports. Based on discussions with the contacts listed below, approximately half the data came from Ontario's In-Place Pollutants Program, which monitored areas in and around the Great Lakes. These data include approximately 200 stations from the following areas, and may have contained primarily metals data:

- Lake Ontario
  - Hamilton Harbour
  - Humber Bay
  - Toronto Harbour and Eastern Waterfront
  - Oakville Harbour
  - Ashbridges Bay
  - East Headland
  - Frenchman Bay
  - Port Weller Harbour
  - Bay of Quinte
- Rivers
  - St. Clair River
  - St. Marys River
  - Niagara River
  - St. Lawrence River
  - Detroit River

Additional data with more chemical classes represented were obtained from 19 Great Lakes benthic survey reports, although exactly which ones are not stated in the criteria development reports. The SLC database would normally be available from Ontario Ministry of the Environment, however, their primary sediment specialist (Rein Jaagumagi) who was familiar with these data has recently left for private consulting, and they have not yet hired a replacement. Until that time OME is not able to respond to inquiries regarding the data.

Derivation Methods

Using the SLC method, SQVs are developing using the following procedure (illustrated in Figure F-1):

- A database is assembled with synoptic benthic community data and chemistry. Chemical concentrations for nonpolar organic chemicals are normalized to organic carbon.

- For each species and chemical, the presence or absence of the species is determined in each sample and the concentrations at which the species is present are graphed by increasing concentration. A minimum of 10 data points is required for this step.

- The 90^{th} percentile of this distribution is determined and considered to be a conservative estimate of the tolerance threshold for that species to that chemical.

- For each chemical, the tolerance thresholds for all the species are graphed in order of increasing concentration. A minimum of 20 tolerance thresholds for different species are required to continue with calculation of SLCs.

- The 5th percentile of this distribution is determined and designated as the Lowest Effect Level. LELs for nonpolar organic chemicals are converted back to dry weight using an assumption of 1% TOC.

- The 95th percentile of this distribution is determined and designated as the Severe Effect Level. SELs for nonpolar organic chemicals are not converted back to dry weight; instead, this step is done on a site-specific basis using actual measured TOC concentrations.

Quality Assurance

Quality assurance measures were described in the original data reports from the 1980s, which were not available for review. Standard quality assurance methods of the time for chemical analysis were followed, and contracts for benthic taxonomic included QA measures similar to those followed today, requiring a certain percentage of recounts and classification to the lowest possible taxonomic level.

Reliability Assessments

Reliability assessments of these SQVs were not conducted at the time they were developed, and it does not appear that there were any later assessments of their reliability.

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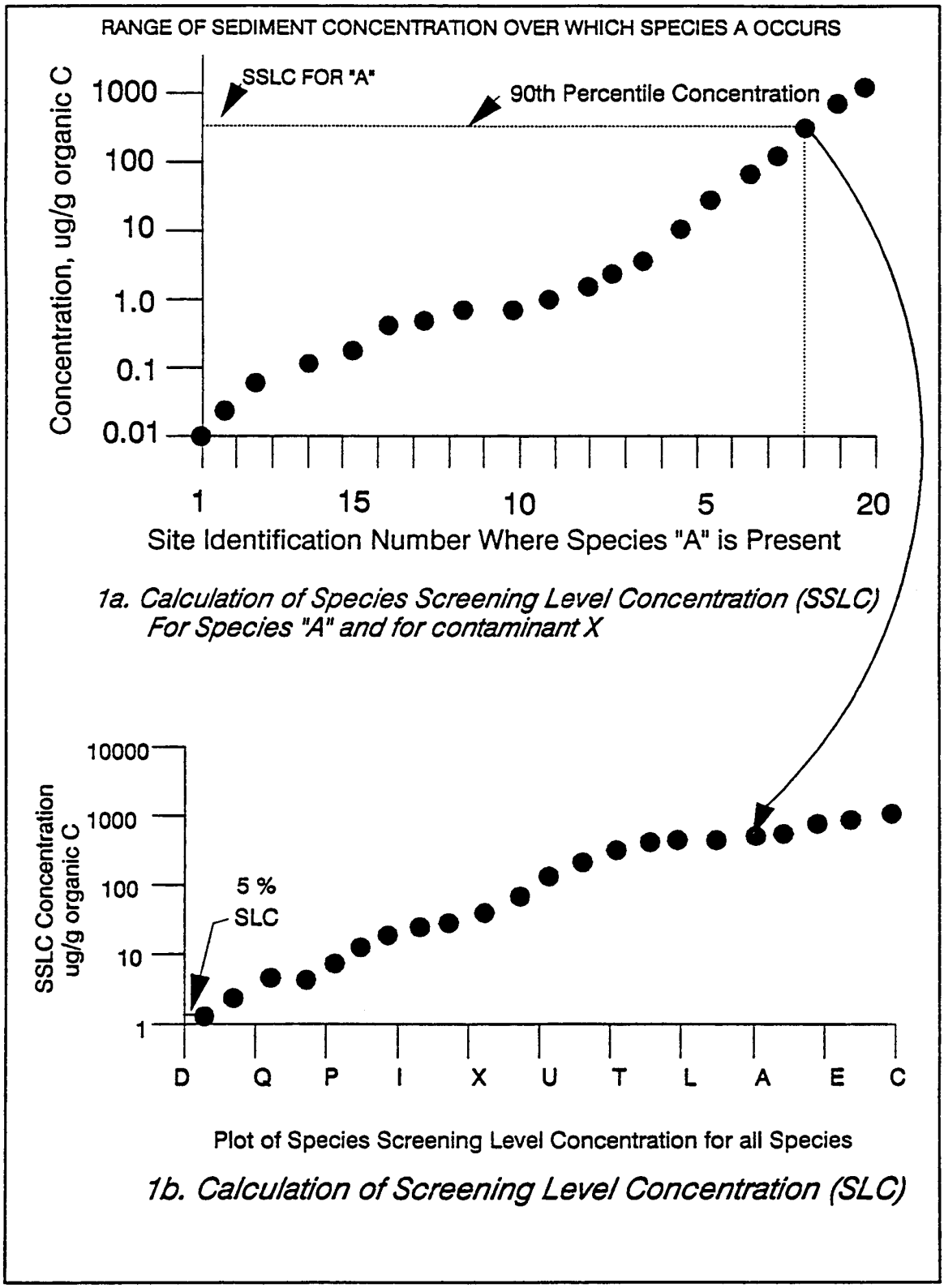

Figure F-1. Screening Level Concentration Calculation

APPENDIX G

Equilibrium Partitioning

data for the more sensitive life stages were used. The geometric mean of the Species Mean Acute Values in a given genus was then used as the Genus Mean Acute Value.

- Chronic values were calculated in a similar manner. When both acute and chronic data were available for the same study, an acute-chronic ratio was calculated. The Species Mean Acute-Chronic Ratio was calculated as the geometric mean of the available acute-chronic ratios for that species.

- Because in most cases, the data requirements for calculating a Final Acute Value were not met (species in at least 8 different families, including salmonids, other fish, amphibians, crustaceans, insects, and molluscs), the procedure for calculating Secondary Acute Values was used. This value is calculated by dividing the lowest Genus Mean Acute Value by a safety factor, which increases as the number of families represented decreases, and which generally ranges from 4 to 22.

- The Final Acute Value was divided by the Final Acute-Chronic Ratio to obtain the Final Chronic Value (or Secondary Chronic Value, as was usually the case).

- The K_{oc} for each chemical was determined using the following equation:
  $\log K_{oc} = 0.00028 + 0.983(\log K_{ow})$

- The EqP SQV (EPA refers to it as the "ESG") was calculated using the following equation:
  $ESG_{oc} = K_{oc} \times FCV$ (or SCV)

- The EqP SQV for PAH mixtures was derived according to the following procedure:
  First, EqP SQVs were calculated for 34 individual PAHs, using the procedure described above.

- In an actual sediment sample, the concentration of each PAH is divided by its ESG to obtain a sediment toxic unit, and each of these individual sediment toxic units are summed as shown in the equation below to obtain a value known as the ESGTU. If the sum of the toxic units is less than 1, the PAH mixture is expected to be non-toxic. Therefore, the SQV is stated as ESGTU ≤ 1.

$$ESGTU = \Sigma\, C_i/ESG_i$$

The EqP SQV for mixtures of metals (cadmium, copper, lead, nickel, silver, and zinc) was derived according to metals partitioning theory, which states that certain metals will preferentially bind to sulfide ions (S^{-2}) in sediments that are currently bound to iron, displacing the iron. These metals are typically divalent cations, such as Cd^{+2}, Cu^{+2}, Pb^{+2}, Ni^{+2}, and Zn^{+2}. In addition, Ag^{+} is also strongly bound to sulfides. The formula for calculating the total molar concentration of these metals that will bind to sulfides is:

$$\Sigma_i[SEM_i] = [SEM_{Cd}] + [SEM_{Cu}] + [SEM_{Pb}] + [SEM_{Ni}] + [SEM_{Zn}] + \tfrac{1}{2}[SEM_{Ag}]$$

The concentration of silver ions is divided in half because two silver ions bind to each sulfide ion. The summed molar concentration of metals is compared to the total molar concentration of acid-volatile sulfides to determine whether the sulfides can bind all of the metals, or whether some will remain available. Hence, the SQV is stated as:

$$\Sigma_i[SEM_i] - [AVS] \leq 0$$

Quality Assurance

When FCVs or SCVs were available from previous publications, no additional quality assurance was conducted, as such a review would have been conducted during development of the original values. For the chemicals for which new FCVs and SCVs were calculated, a quality assurance review and screening of laboratory data obtained from AQUIRE was conducted. Detailed screening procedures are described in EPA (2000d), and included:

- Adequacy and availability of documentation
- Appropriate test chambers
- Appropriate test material (e.g., not drilling mud, fly ash, etc.)
- Pure reagents, not chemical mixtures, miscible with water
- Chemical concentrations did not vary inappropriately
- Test organisms were aquatic North American organisms, greater than single-celled
- Tests used whole organisms, not tissues or cell cultures
- Appropriate life stages were used
- Organisms were not stressed or diseased
- Feeding regime was appropriate
- Enough individuals and enough replicates were used
- Controls were used and results were acceptable
- Water quality parameters were acceptable
- Other test protocols were met
- The tests measured appropriate biological effects endpoints
- An LC50 or EC50 were reported

Reliability Assessments

A variety of laboratory studies have been conducted to verify the accuracy of the EqP model (see EPA 2000c,d,e,g). Various underlying assumptions have been successfully tested in the laboratory, including:

- Freshwater and saltwater partitioning is similar for nonionic organic chemicals

- Benthic and water column organisms respond similarly to toxic chemicals in water
- Organic carbon content affects the toxicity of organic chemicals in bulk sediments, and OC-normalization reduces the variability of this toxicity

- Log K_{oc} is approximately equal to log K_{ow}, up to approximately log K_{ow} of 5

- Above log K_{ow} of 5, it is necessary to take into account the complexation of organic chemicals to dissolved organic carbon in water

- Freely-dissolved interstitial water concentrations are successfully predicted from bulk sediment concentrations using the partitioning model

- Toxicity of chemicals in sediments and interstitial water to test organisms show a dose-response relationship

- The toxicity of most nonionic chemicals is additive, as predicted by the narcosis model

- AVS complexes certain metals, such that no toxicity is observed in laboratory tests when AVS exceeds the molar concentrations of these metals.

While many of the basic aspects of the chemical partitioning model have been verified in the laboratory, certain areas remain outstanding:

- The reliability of many of the criteria for many of the newer individual chemicals has not been verified by independent tests, and these criteria were developed using a small set of data for only a few species. For those chemicals such as Endrin and Dieldrin that have sufficient data to estimate uncertainties, there is a range of about one order of magnitude around the criteria value that encompasses most of the false positives and false negatives.

- The EqP equations for PAH and metals mixtures appear to have almost no false negatives; below these values almost no toxicity has been observed in laboratory tests. However, there above the SQVs, approximately 1/3 of the data are non-toxic. In both cases, EPA recommends that further toxicity testing be conducted if the SQVs are exceeded.

- Some of the underlying assumptions successfully tested in the laboratory do not appear to hold true in field data – for example, for field data with mixtures of chemicals, dry weight SQVs have consistently been shown to be as or more reliable compared to organic carbon-normalized SQVs. Although the reasons for this are as yet unknown, it suggests that field conditions are sufficiently more complex than laboratory conditions that the model may not successfully predict toxicity in the field.

- With the exception of the narcosis-based PAH mixture values, the EqP values have not been subjected to a reliability assessment against field data, in particular benthic data. It is likely that their reliability in predicting actual impacts would be low, since many chemicals of concern, including a number of important metals, are not included on the list of existing criteria.

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APPENDIX G. EQUILIBRIUM PARTITIONING

Data Sets

Final Chronic Values are based on laboratory water toxicity tests with a variety of vertebrate and invertebrate species, including amphipods, barnacles, bivalves, snails, cladocerans, flies, midges, various other benthic invertebrates, sea urchins, crustaceans, salmonids, other fish, and amphibians. Exact numbers and types of species vary from chemical to chemical. The studies used for most chemicals are listed in the supporting documents (USEPA 2000a,b,d,e), although in some cases the original Water Quality Criteria documents are referenced instead.

For twelve of the chemicals of concern in sediments, toxicity data were available for relatively few species, in some cases only one (usually *Daphnia* sp.). For most other nonionic organic chemicals, data were available for less than eight species. Only one chemical (Diazinon) had the amount of data normally required to calculate a Final Chronic Value. This issue was not so much a concern for the PAH mixtures, since narcosis-based toxicity occurs at the same molar concentration for all PAHs.

Acute toxicity tests were typically 48-hr to 96-hr tests used to determine an EC50 or LC50. Effects endpoints included mortality, immobilization, incomplete development of shells (crustaceans), and loss of equilibrium. Chronic toxicity tests included life-cycle tests, partial life-cycle tests, and early life-stage development tests. Effects endpoints included survival, growth, maturation, eggs spawned, embryo viability (salmonids), and hatchability.

Note that for metals, similar toxicity tests were not conducted, as final chronic values for water are not used to predict the toxicity of metals in sediments. Instead, AVS/SEM theory predicts that when the amount of AVS is greater than the amount of SEM on a molar basis, metals will be sequestered and not bioavailable. Therefore, their actual toxicity is moot. Several studies have been conducted to verify the AVS/SEM theory; these studies are summarized in EPA (2000c).

K_{ow} values were determined either through laboratory measurements using the slow-stir, generator-column, and shake-flask methodologies, or through a literature search. When more than one value was available, the arithmetic mean of the log K_{ow} values was selected. Recommended K_{ow} values for EqP calculations were summarized by Karickhoff and Long (1995, 1996).

Derivation Methods

EqP values for nonionic organic chemicals were derived according to the following procedure:

- Chronic toxicity values for each chemical in water were compiled if available. Ideally, these would be Final Chronic Values, as derived in the Water Quality Criteria documents. However, as noted above, there were generally not enough data to rigorously follow this procedure, and Final Chronic Values were not available for most chemicals. Secondary Chronic Values were available for some chemicals, developed by Oak Ridge National Laboratories using a procedure designed for use with fewer data. These values are typically more conservative than Final Chronic Values to compensate for their uncertainty.

- For the remaining chemicals, new chronic toxicity values were derived using Final Chronic Value or Secondary Chronic Value methodologies. Data were obtained from the AQUIRE database and screened to ensure that they were appropriate for use. Species Mean Acute Values were calculated as the geometric mean of the acceptable values for each species. If more than one life stage was tested,

APPENDIX H

Numeric SQVs
For
Freshwater Sediments

APPENDIX H. NUMERIC SQVS FOR FRESHWATER SEDIMENTS

Table H-1. Numeric SQVs for Freshwater Sediments

CHEMICAL	AET*	PAET*	NEC*	ERL*	ERM*	TEL	PEL	TEC	PEC	LEL	SEL	EqP
Metals (mg/kg)												
Antimony	64	35										
Arsenic	40	19	93	12	33	5.9	17	9.8	33	6	33	
Cadmium	7.6	7.6	8	0.7	3.9	0.6	3.5	0.99	4.5	0.6	10	
Chromium	280	70	95	39	270	37	90	43	110	26	110	
Copper	840	340	55	41	120	36	200	32	150	16	110	
Lead	260	240	69	51	99	35	91	36	130	31	250	
Mercury	0.56	0.22				0.17	0.49	0.18	1.1	0.2	2	
Nickel	46	39	38	24	45	18	36	23	49	16	75	
Silver	4.5	3.9										
Zinc	520	500	540	110	420	120	320	120	460	120	820	
SEM-AVS (um/g)												0
Conventionals												
Ammonia (mg/kg)	930	340										
Total Kjeldahl N (mg/kg)										550	4800	
Sulfides (mg/kg)	130	127										
AVS (um/g)			8.9	5.1	16							
Phosphorus (mg/kg)										600	2000	
TOC (percent)	14	7.1	4	1.7	3					1	10	
PAHs (ug/kg)												
Napththalene	46000	37000	290	13	98	35	390	180	560			
Acenaphthylene	2200	1900				5.9	130					
Acenaphthene	4100	3500				6.7	89					
Fluorene	4200	3600	290	10	140	21	140	77	540	190	1600	
Phenanthrene	15000	5700	1000	27	350	42	520	200	1200	560	9500	
Anthracene	2800	2100	290	10	140	47	250	57	850	220	3700	
TOTAL LPAH	74000	36000	3100	80	650							
Fluoranthene	21000	11000	1200	33	180	110	2400	420	2200	750	10000	
Pyrene	23000	9600	1800	40	350	53	880	200	1500	490	8500	
Benz(a)anthracene	7700	5000	690	19	300	32	390	110	1100	320	15000	
CHEMICAL	**AET***	**PAET***	**NEC***	**ERL***	**ERM***	**TEL**	**PEL**	**TEC**	**PEC**	**LEL**	**SEL**	**EqP**
Benzo(a)pyrene	11000	7000	440	84	470	32	780	150	1500	370	14000	

Table H-1. Numeric SQVs for Freshwater Sediments (Continued)

Indeno(1,2,3-cd)pyrene	760	730	290	30	250					200	3200	
Dibenzo(a,h)anthracene	230	230	870	10	15	6.2	140	33		60	1300	
Benzo(g,h,i)perylene	1400	1200	310	13	280					170	3200	
TOTAL HPAH	91000	36000	6200	170	1800							
TOTAL PAHs	170000	60000	9200	240	2200			1600	23000	4000	100000	
Other Organics (ug/kg)												
2,3,7,8-TCDD	0.0088	0.0072										
Aldrin										2	80	
Benzene												5.7 oc
BHC										3	120	
alpha-BHC										6	100	
beta-BHC										5	210	
delta-BHC												13 oc
gamma-BHC (Lindane)						0.94	1.4	2.4	5	3	100	0.37 oc
Biphenyl												110 oc
Bis(2-ethylhexyl) phthalate	750	635										
4-Bromophenylphenyl ether												130 oc
Butylbenzyl phthalate												1100 oc
Carbazole	140	140										
Chlordane						4.5	8.9	3.2	18	7	60	
Chlorobenzene												82 oc
DDD						3.5	8.5	4.9	28	8	60	
DDE						1.4	6.8	3.2	31	5	190	
DDT								4.2	63			
Total DDTs						1.2	4.8	5.3	570	7	120	
Diazinon												0.19 oc
Dibenzofuran	32000	2400										200 oc
1,2-Dichlorobenzene												34 oc
1,3-Dichlorobenzene												170 oc
1,4-Dichlorobenzene												35 oc
Dieldrin						2.9	6.7	1.9	62	2	910	12 oc
CHEMICAL	**AET***	**PAET***	**NEC***	**ERL***	**ERM***	**TEL**	**PEL**	**TEC**	**PEC**	**LEL**	**SEL**	**EqP**
Di-n-butyl phthalate	43	42										1100 oc
Endosulfan												0.54 oc

Table H-1. Numeric SQVs for Freshwater Sediments (Continued)

alpha-Endosulfan												0.29 oc
beta-Endosulfan												1.4 oc
Endrin						2.7	62	2.2	210	3	1300	5.4 oc
Ethylbenzene												480 oc
Hexachlorobenzene										20	240	
Hexachloroethane												100 oc
Heptachlor epoxide	260	260				0.6	2.7	2.5	16	5	50	
Malathion												0.067 oc
Methoxychlor												1.9 oc
Mirex										70	5300	
PCB-1016										7	530	
PCB-1242	100	100										
PCB-1248	21	21								30	1500	
PCB-1254	7.3	7.3								60	340	
PCB-1260										5	240	
TOTAL PCBs	21	21	190	50	730	34	280	60	680	70	1300	
Pentachlorobenzene												69 oc
Phenol	48	48										
1,1,2,2-Tetrachloroethane												160 oc
Tetrachloroethene												53 oc
Tetrachloromethane												120 oc
Toluene												89 oc
Toxaphene												10 oc
Tribromomethane												65 oc
1,2,4-Trichlorobenzene												920 oc
1,1,1-Trichloroethane												210 oc
Xylene												2.5 oc

*Lowest of the available SQVs for several biological tests

APPENDIX I

Freshwater Sediment
and
Toxicity Data Contact List

Freshwater Sediment and Toxicity Data Contact List

Date	Name	Agency	Phone Number	E-mail	Alternate Contact	Other Comments
9/20/01	Robert (Bob) Raforth	Ecology (Central Regional Office)	509-457-7113	rraf461@ecy.wa.gov	Rick Fry/Dave Smith USGS Denver	Only has limited, raw data. Stated that Ecology may have access to most of it already.
9/21/01	John Rolen	Ecology Spokane River (Eastern Regional Office)	509-625-5182 / Receptionist: 509-456-2926	jrol461@ec.wa.gov		
Last contacted 12/5/01	John Wegrzyn	DEQ (Portland Hbr)	503-229-5086	wegrzyn.john@deq.state.or.us	Bruce Hope	Referred to Bruce Hope at Oregon DEQ, who will provide contact information for each OR regional office. 12/5/01: Has already provided all possible data sets and contact names to Ecology.
	Bruce Hope	DEQ (Portland Hbr)				
10/10/01	Laura Hamilton	COE Portland (Portland HBR)	503-808-4898		Mark Siipola	Only has three data sets that would meet general criteria (due to lack of bioassay studies): Astoria east boat basin 1998 (marine), Columbia Slough 1999 (already have), and Tongue Point 1988 (marine).
	John Malek	EPA Region 10				
	Wally Reed	EPA Region 10				
	Bob Blank	USGS Tacoma (Lk Roosevelt)	253-428-3600			
	Mark Munn	USGS Tacoma (Lk Roosevelt)	253-428-3600			
last contacted 2/4/02	Geoff Harvey	IDEQ (Idaho)	208-769-1422	gharvey@deq.state.id.us		Doesn't know of any data besides Coeur d'Alene data. Rarely works with bioassay data. IDEQ has not collected sediment quality data given the low level of industrial development in Northern Idaho. Referred to USGS NAWQA website.
	Mike McFarlane	Fraser River, BC		Mike.Macfarlane@gems2.gov.bc.ca		
10/5/01	Josh Gravenmeier	Harding ESE (San Francisco)				Contacted by Teresa, no relevant data available, mostly ITI data, benthic data but no chemistry and no bioassay. Referred to the San Francisco Dredging Authority web site.
9/19/01	Dr. Richard Kocan	University of Washington School of Fisheries	206-685-2984	Kocan@u.washington.edu		UW is not conducting research in this area
9/24/01	Dave Smith	USGS (Denver)	303-236-1849	dsmith@usgs.gov		Has mostly geo-chemistry data with some sediment and water data; Dept. of Energy's National Uranium Resource Evaluation Program; "RASS" and "PLUTO" USGS databasesReferred to website for info is http://greenwood.cr.usgs.gov/pub/open-file-reports/ofr-97-0492/index.html under FW Sed. Directory and is called "USGS Denver Available Info"
9/19/20	Mike Graybill	South Slough (NERR)	541-888-5558		Steve Rumrill (South Slough), Alan Nelson (USGS, Boulder Colorado)	The majority of work in South Slough was for TBT through Tina Whoainakowski who has since moved on.
10/9/01	Steve Rumrill	South Slough (NERR)	541-888-5558			
9/20/01	Mark Siipola	USACE (PDX)	503-808-4885		Laura Hamilton	Reconciling lat/long information in older data sets, due to the proposed channel deepening. Referred to Laura Hamilton.
9/14/01	Henry Lee II	EPA-EMAP HMSC	541-867-5001	lee.henry@epa.gov	John Stoddard Corvallis EPA (stream EMAPs?) 541-754-4428, Roger Blair Corvallis EPA Overview responsibility 541-754-4662, Steve Paulson Corvallis EPA 541-754-4428	Possibly 20-30 freshwater EMAP stations on entire west coast, may be ready in 6 months. Corvallis lab does not do sediment toxicity.
10/10/01	John Stoddard	EPA (Corvallis)	541-754-4441	stoddard.john@epa.gov		Referred to Phil Kaufman
10/10/01	Roger Blair	EPA (Corvallis)	541-754-4662	blair.roger@epa.gov		Referred to Phil Kaufman
10/10/01	Steve Paulson	EPA (Corvallis)	541-754-4428	paulsen.steve@epa.gov		Referred to Phil Kaufman
10/18/01	Luis LaFuste	USGS (Tacoma)	253-428-3600 ext 2653	lafuste@usgs.gov	Mr. Sandy Williamson-Natl Wtr Qual Assmnt, or Richard Wagner	Referred to Sandy Williamson and website.
10/10/01	Richard Wagner	USGS (Tacoma)	253-428-3600 ext 2685			Out until 10/22/01
10/10/01	Phil Kaufman	EPA (Corvallis)	541-754-4451	kaufmann.phil@epa.gov		Has some data avialable, but is not sure it is what we are looking for. Requested an email with the outline and explanation for everything we would need.
10/10/01	Rick Kepler	ODFW (Water Prgm Mngr)	503-872-5255 ext 5426	Rick.J.Kepler@state.or.us		Does not use sediment chemistry or bioassay data. Referred to Greg Pettit, Rick Hafley at DEQ Lab 503-229-5983, Jay Nicholas, Tom Nicholson, and Mr. Kelly Moore at OWEB 541-757-4263
10/10/01	Jay Nicholas	OR Wtrshd Enhncmnt Bd	Corvallis 541-757-4263 ext 224, Salem 503-986-0204			unavailable
10/10/01	Tom Nicholson	OR Wtrshd Enhncmnt Bd	Corvallis 541-757-4263 ext 223			unavailable
10/10/01	Mr. Kelly Moore	OR Wtrshd Enhncmnt Bd	Corvallis 541-757-4263 ext 226			They focus on suspended solids and do not do sediment chemistry. Upcoming project in the Willamette River will collect sediment chemistry .
10/18/01	Angie Obery	ODEQ Western Region	Eugene 541-686-7838 ext 265			Unaware of any relevant data. Referred to John Wegrzyn (NW Region.
10/18/01	Greg Pettit (sp?)	ODEQ Lab	PDX 503-229-5983		Rick Hafley ODEQ Lab	Completed 50 Columbia River sites in 2000 as part of the coastal EMAP. Data won't be released for 6 weeks.
10/18/01	Sandy (Alex K) Williamson	USGS water div Tacoma	253-428-3600 ext 2683	akwill@usgs.gov		Referred to http://water.usgs.gov/nawqa/data .

Freshwater Sediment and Toxicity Data Contact List

Date	Name	Agency	Phone Number	E-mail	Alternate Contact	Other Comments
12/5/01	Ian Waite	USGS (Corvallis of PDX)	1-503-251-3463	iwaite@usgs.gov		Possibly has data for Yakima and Puget Sound.Referred by Glen Merritt and Dr. Richard Pratt as someone who may know if they have any benthic data.
12/5/01	Dr. Richard Pratt	Portland State University	1-503-725-3419			No available bioassay data.
12/5/01	Dr. Judy Li	Oregon State University (FW Dept., stream team)				Left a message.
12/5/01	JayLene Seeley	OSU Environmental and Molecular Toxicology Program Assistant	1-541-737-3791			Will check potential contacts for data sets.
12/5/01	Stan Gregory	OSU Stream Ecologist	1-541-737-1951	stanley.gregory@orst.edu	Larry Curtis, OSU Environmental and Molecular Toxicology Dept. director. 541-737-3791	Knows of no such data within the FW Dept, and is unsure if the Environmental and Molecular Toxicology Dept. would have any either.
11/26/01, 12/5/01, 12/13/01	Larry Curtis	OSU Environmental and Molecular Toxicology Dept. director	1-541-737-3791			
12/5/01, 12/7/01	Alan Herlihy	OSU Biogeochemist/Ecologist, EPA employee	1-541-754-4442	herlihy@heart.cor.epa.gov		"EMAP rarely include sed chem/bioassay data." Only knows of some for the Rocky Mtns and mid-Atalantic surveys.
12/5/01	Michael Mix	OSU Bio Dept Chair, Env contaminants sepcialist, mine tailings	1-541-737-1743			left a message.
	Bob Black	USGS Tacoma	1-253-428-3600 ext. 2687			referred by Ian Waite
	Jennifer Morace	USGS PDX	1-503-251-3229			would be the one able to pull the data as requested. Specificall the Yakima data.
1/29/02	Frank Rinella	USGS PDX Data Base manager	1-503-251-3277			Contact on 1/29/02 - referred us to USGS NAWQA website
12/6/01	Phil Larson	EPA Corvallis, EMAP	1-541-754-4362			Knows of no such data within EMAP
12/12/01	Laurie Hennings	Portland Metro	1-503-797-1940	hennings@metro.dst.or.us		Knows of no data, but will pass along this request throughout Metro.
12/5/01, 12/7/01	Dick Miller	Private Consultant (retired)	1-541-753-5333			Referred by Dr. Judi Li (OSU) left messages
12/12/01	Eugene Water and Electric Board (EWEB)		1-541-984-4747			no data
12/12/01	Oregon Division of State Lands	Headquarters	1-503-378-3805			no data
12/12/01	Oregon Division of State Lands	eastern region	541-388-6112			no data
	Jennifer Peterson	City of Portland				Referred by Judi Li (OSU) as a student who reviews sediment samples for the City. Grad student of Dr. Paul Jepson (OSU).
12/7/01	Dr. Paul Jepson	Entomology Department Chair OSU	1-541-737-9082			left a message
11/26/01, 12/12/01, 1/3/01	Jeremy Buck	USFW	1-503-231-6179			Does not have any bioassay data. Does have some Columbia River sediment data.
12/12/01	Mitch Postal	Haden Bridge Filtration Laboratory supervisor (referred by Eugene Water and Electric Board-EWEB)	1-541-984-4706			There is no data in the McKenzie region that he knows of.
12/12/01	Lori Power	EWEB Environmental Division	1-541-484-2411			left a message

APPENDIX J

Screening Checklists

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Weyerhaeuser-Longview Pulp and Paper Mill Class II inspection

Date of Survey(s): Apr-90

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?

Contact: Jeanne Andreasson

Notes: Ecology reference: SY-19

Phone Number

Date Prepared: Apr-91

Prepared By: Jeanne Andreasson

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
conventionals, metals, SVOCs, PCBs, pesticides, PAHs

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: EPA 1983, 1986, 1987, 1989; Tetra Tech 1986

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N): Y

- If NO, data for that chemical class is not acceptable.

List metals extraction method:

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☒	☐		☒	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☒	☐	☐	☒	☐
Metals	☒	☐	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
data report appendix

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyalella azteca, microtox, Daphnia magna

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 3

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
low replication of bioassays

Priority for data entry:
☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Sediment quality near Gas Works Park, Lake Union

Date of Survey(s): Sep-85

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?:

Contact:

Notes: Ecology reference: SY-23

Phone Number:

Date Prepared: Oct-86

Prepared By: Yake, Norton, & Stinson

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.): conventionals, metals, organics

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) N

List methodology: APHA 1985, EPA 1979, Parametrix/Buchanin & Kain 1979,

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☒	☒		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☒	☒	☐	☐	☐
Metals	☒	☒	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
none provided

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) ?
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) N

List methodology: Nebecker 1984

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 3

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☒ All data are rejected. List reasons for data rejection:
low bioassay replication; no QA/QC documentation;
non-standard analytical methods

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry:
☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Sediment-Quality Assessment of Franklin D. Roosevelt Lake and the Upstream Reach of the Columbia River, Washington

Date of Survey(s): Sept - 92

Location of Master Copy of Survey Report/Data:

Agency: USGS

Contractor Name?:

Contact:

Notes: Ecology Reference: 0027; SY-32

Phone Number:

Date Prepared: 1992 / Revised 1994

Prepared By: USGS

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
Determined from map.

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.): Metals, SVOCs Dioxin/Furans, TOC, Rgain Size, Resin, Chlorinated Phenols

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y*

List methodology: Multiple methods of analysis were conducted for comparison between laboratories and methods. EPA 6010; EPA 8290; modified method descriptions proveded in report for dioxin/furans and SVOCs;

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y

- If NO, data for that chemical class is not acceptable.

List metals extraction method: SAD

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☒	☒	☐	☒	☒
Pesticides/PCBs	☐	☐	☐	☐	☐
Dioxin/Furans	☒	☒	☐	☒	
Metals	☒	☒	☒	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
limited QA discussed throughout reports; briefly discussed in lab report.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyallela azteca; Ceriodaphnia dubia; Microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM (1991), Burton (1992), Susson-Brickson & Burton (1991)

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 3 H. azteca
10 C. dubia

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) N

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:
Much data is missing; however, the data present appears valid.

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Determination of Miscellaneous Metals…from Milltown Reservoir and Clark Fork River, Montana

Date of Survey(s): 1991

Location of Master Copy of Survey Report/Data: SAIC - Bothell, Washington

Agency: USGS

Contractor Name?: Columbia Environmental Research Center

Contact: Thomas May

Notes: thomas_may@usgs.gov

Phone Number: 573-876-1858

Date Prepared: 1992-1993

Prepared By:

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): N

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.): Metals, Sulfide Mercury

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): N

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N): Y

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐	☐	☐	☐
SVOCs	☒	☒	☐	☒	☒
Pesticides/PCBs	☐	☐	☐	☐	☐
Dioxin/Furans	☒	☒	☐	☒	
Metals	☒	☒	☒	☒	

- Omission of some QA/QC may not necessarily result in data rejection. Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Self reported in report.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y*
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.
One set of samples were stored 26 months.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyallela azteca; Daphnia magna; Chrionomus; Microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) N*

List methodology: SOP C5.179, C5.127, C5.151, C5.148, C5.145, C5.149

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 4

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) ?
- If NO, data for that bioassay is not acceptable.
Positive bioassay control run (minimum of one per batch)? (Y/N) ?
- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?
- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for bioassays:
-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
QA was mostly self reported; however, sufficient data was included for QA1 review, if necessary

Priority for data entry:
☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y
- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N
- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): TOSCO Sediment Sampling Results 1999

Date of Survey(s): May-97

Location of Master Copy of Survey Report/Data:

Agency: None

Contact:

Phone Number:

Date Prepared:

Prepared By: Marty Cramer

Contractor Name?:

Notes: Sedqual code - TOSCO99

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Metals, SVOCs, Pesticides, PCBs, PAHs, TOC, Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: 3550A/SIM, ASTM D422, EPA 160.4 (modified), EPA 350.1M, EPA 7471A, EPA 7740 EPA 8081 (modified), EPA SW8082 GC-ECD, EPA 6010B, EPA 7060A, EPA7841, PSEP protocols SW9030M

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Sedqual Indicates QA2 was performed.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y*
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
Some values appear high, however, values appear to be properly qualified.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Chronomus tentans, Hyalella azteca

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) ?
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 3 each

Survey Name: _____

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☐ High - acceptable data ☒ Already entered in Sedqual

☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

Survey Name: _____

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): Lower Columbia Backwater Recon. Survey

Date of Survey(s): Jun-93

Location of Master Copy of Survey Report/Data:

Agency: Tetra Tech??

Contractor Name?:

Contact:

Notes: Sedqual code - LCBWRS93

Phone Number:

Date Prepared:

Prepared By:

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Metals, SVOCs, Pesticides, PCBs, PAHs, TOC, Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: EPA 206.2 Graphite Furnace AA; Inductively Coupled Plasma AA; Manual Cold Vapor AA;

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
unknown

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyallela azteca

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

Survey Name: _____

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☐ High - acceptable data ☒ Already entered in Sedqual

☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

Survey Name: _____

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): Lower Columbia Backwater Recon. Survey

Date of Survey(s): Jun-93

Location of Master Copy of Survey Report/Data:

Agency:

Contact:

Phone Number:

Date Prepared:

Prepared By: Tetra Tech

Contractor Name? Tetra Tech

Notes: Sedqual code - LCBWRS93

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Metals, SVOCs, Pesticides, PCBs, PAHs, TOC, Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: EPA 206.2 Graphite Furnace AA; Inductively Coupled Plasma AA; Manual Cold Vapor AA;

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
unknown

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyallela azteca

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y
- If NO, data for that bioassay is not acceptable.
Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): Portland Shipyard Sediment Investigation Data Report

Date of Survey(s): Mar-98

Location of Master Copy of Survey Report/Data:

Agency: Port of Portland

Contractor Name?:

Contact:

Notes: Sedqual code - PSYSEA98

Phone Number:

Date Prepared:

Prepared By: Striplin Env. Asst

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Metals, SVOCs, Pesticides, PCBs, PAHs, TOC, Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N): N

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Sedqual Indicates QA2 was performed.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
Some values appear high, but appear to be properly qualified.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyalella azteca, Chironomus tentans, Microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) ?
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 8 (C. tentans and H. azteca)
5 (Microtox)

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y
- If NO, data for that bioassay is not acceptable.
Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Sediment Samplig Report Seattle Commons Parcel C

Date of Survey(s): Mar-94

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?:

Contact:

Notes: Ecology Reference SY-31

Phone Number:

Date Prepared: Jun-94

Prepared By: Shannon and Wilson

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.): Metals, SVOCs, PCBs, TOC, Ammonia, TBT, Grain size, Total solids

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: PSEP; SW-846; CLP

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☒	☒	☐	☒	☒
Pesticides/PCBs	☐	☒	☐	☒	☐
Metals	☐	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Lab reports/summaries

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:
* Cd, Pb, and Se results are estimates due to problem with spike recovery.

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca; Microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM; modified PSEP

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) N

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? Y

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Concentrations of Chemical Contaminants and Bioassay Response to Sediments in Salmon Bay, Seattle

Date of Survey(s): May-97

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contact:

Phone Number:

Date Prepared: Dec-00

Prepared By: Serdar, Cubbage, & Rogowski

Contractor Name?

Notes:

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Conventionals, metals, SVOCs, Butyltins, PCBs

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: EPA, SW-846, PSEP

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method:

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☒	☒	☒	☒	☒
Pesticides/PCBs	☒	☒	☒	☒	☒
Metals	☒	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
data report appendix, text summary

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) Y
If YES, list problems:
marix interference effects with analysis of SVOCs and butyltins
Report states that butyltin data quality is poor and PCB data should be used with caution due to questionable accuracy

Holding times met? (Y/N) N
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.
The re-extraction for PCBs analysis exceeded the reccomended holding time; the analysis of total solids exceeded hoding time by one day

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyalella azteca survival; Chironomus tentans survival & growth

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM 1994

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? (Y/N) 5
- ASTM requires 8 replicates for 10-day freshwater tests
- ASTM requires 4 replicates for 30-day freshwater tests
- Marine bioassays have a minimum standard of 5 replicates
- If NO, data for that bioassay is not acceptable

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
TBT and PCBs results should not be used due to analytical difficulties

Priority for data entry:
☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Station Hazard Assessment Report; Hansville Landfill Kitsap County

Date of Survey(s): Dec-91

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?

Contact: Barb Morrison

Notes: Ecology Reference: SY-30

Phone Number: (206?) 754-7077

Elaine Atkinson (206?) 649-7042

Date Prepared: Dec-91

Prepared By: SAIC

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) N

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
dummy coordinates could be assigned based on location information presented in report

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.): VOAs, Metals, Organics, pesticides, PCBs

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: SW 846, ICP 6010

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☒	☒		☒	☒
SVOCs	☒	☒	☒	☒	☒
Pesticides/PCBs	☒	☒	☒	☒	☒
Metals	☒	☒	☒	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
separate QA report (appendix)

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) Y
If YES, list problems:
Cadmium values estimated due to method blank contamination and Chromium values estimated due to matrix interference.

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) ?
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
detection limits not provided, however most values appear to meet SAPA detction limits.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyalella azteca

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM E 1383

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? Y

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Ferndale Wastewater Treatment Plant, Class II inspection

Date of Survey(s): Feb-88

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?

Contact: Carlos Ruiz

Notes: Ecology reference: SY-17

Phone Number

Date Prepared

Prepared By: Carlos Ruiz

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): N

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
conventionals, EPA priority pollutants

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: EPA 1985, 1986; APHA 1985

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☒	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☒	☐	☐	☐	☐
Metals	☒	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
discussed in report text

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: microtox, ceriodaphnia dubia

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology: Microtox

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) N
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test?

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

no QA report available

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☒ All data are rejected. List reasons for data rejection:
lack of available information including QA/QC

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry:
☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Pacific Woodtreating Corporation, Ridgeway, WA, Class II Inspection

Date of Survey(s): Apr-89

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?

Contact:

Notes: Ecology reference: SY-11

Phone Number:

Date Prepared:

Prepared By: Don Reif

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) N

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
No official documentation of station location available, some hand written coordinates were provided on documents reviewed

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
VOAs, pesticides, PCBs, metals, conventionals, PAHs

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: EPA, APHA

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
?

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:
protocols were questioned, holdin

Holding times met? (Y/N) N
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.
holding times for SVOCs were exceeded

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Daphnia magna, Ceriodaphnia dubia, Selanastrum

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: EPA 1985, Nebecker 1984

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) N
If NO, test is not acceptable - indicate what test(s):
information regarding replication was not available

If YES, what are the minimum number of replicates conducted per test?

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y
- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) N
- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?
- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for bioassays:
-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☒ All data are rejected. List reasons for data rejection:
uncertaities regarding data collection and accuracy of reported values, incomplete information to adequately screen data set

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry:
☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N
- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N
- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): Terminal 4 Slip 3 Sediment Investigation

Date of Survey(s): Jan-98

Location of Master Copy of Survey Report/Data:

Agency: Port of Portland

Contractor Name?:

Contact:

Notes: Sedqual code - WLRPT498

Phone Number:

Date Prepared:

Prepared By: Pad Quinn

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Metals, SVOCs, PAHs, TOC, Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N): N

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Sedqual Indicates QA1 was performed.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
Some values appear high, but appear to be properly qualified.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyalella azteca, Chironomus tentans

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) ?
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 8

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y
- If NO, data for that bioassay is not acceptable.
Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): McCormick & Baxter Creosoting Company Remedial Investigation

Date of Survey(s): Phase 1: 9/90-10/90; Phase 2: 1/92

Location of Master Copy of Survey Report/Data: Washington Department of Ecology

Agency: Oregon DEQ

Contractor Name?: PTI

Contact: Paul Burnet

Notes: Ecologfy Reference: SY-1

Phone Number: (503) 229-6251

Date Prepared: Sep-92

Prepared By: PTI

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
A grid system was developed using 150' by 150' cells.

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
SVOC's, PCDDs/PCDFs, pesticides, metals, TOC, grain size

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: SW-486

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method:

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☒	☒	☐	☒	☒
Pesticides/PCBs	☒	☒	☐	☒	☒
Metals	☒	☒	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
separate QA report (appendix)

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
Data qualified by independent data validation

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca mortality

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM; modified Beckman 1982 (microtox)

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? Y

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Results of acute toxicity tests on freshwater sediments collected from Silver Lake, WA, using Hyalella azteca and microtox

Date of Survey(s): October 1992; March 1993

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: City of Everett

Contractor Name?:

Contact: Jane Zimmerman

Notes: Ecology reference: SY-27

Phone Number:

Date Prepared:

Prepared By: Parametrix

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) N

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) N

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
maps provided, but no sampling location coordinates

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
metals, pesticides, PCBs, SVOCs, ammonia

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) ?

List methodology: methods not provided

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) N

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?>

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☒	☐
SVOCs	☐	☐	☐	☒	☐
Pesticides/PCBs	☐	☐	☐	☒	☐
Metals	☐	☐	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
summary of QA in report

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.
no information on holding times provided

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyalella azteca, microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM, PSEP

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? ?

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) Y

If YES, list problems:

amphipod test was not aerated at test initiation; water quality parameters not measured for controls

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☒ All data are rejected. List reasons for data rejection:

Data are not synoptic

Incomplete data report, no information regarding analytical methods

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry:

☐ High - acceptable data

☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Results of sediment sampling in Baxter Cove, Lake Washington

Date of Survey(s): Jun-91

Location of Master Copy of Survey Report/Data: Washingotn Department of Ecology, Lacy, WA

Agency: Washingotn Department of Ecology

Contractor Name?:

Contact: Dale Norton

Notes: Ecology reference: SY-22

Phone Number:

Date Prepared: May-92

Prepared By: Dale Norton

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
conventionals, PAHs, PCBs, chlorophenol

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: EPA 1986

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
QA discussion in report

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.
no mention of hoding times

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca, microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM 1990, Tetra Tech 1986

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
limited results information provided in document reviewed

Priority for data entry:
☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Distribution and significance of PAHs in Lake Washington sediments adjacent to Quendall Terminals/J.H. Baxter site

Date of Survey(s): May-90

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?

Contact:

Notes:

Phone Number:

Date Prepared: May-91

Prepared By: Dale Norton

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
Marginal quality map with no coordinates listed

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
metals, PAHs, PCBs, conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: EPA 1986

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☒	☒	☒	☒	☒
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☒	☒	☒	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Data report appendix

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca, Daphnia magna

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: Nebeker et al 1984

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Bioassays were not the primary focus, consequently only a brief evaluation of the data is presented.

No problems noted; all data looks acceptable.

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Mill Creek and East Drain Sediment Sampling Report, Western Processing, Phase II

Date of Survey(s):

Location of Master Copy of Survey Report/Data: Washington Department of Ecology

Agency: Washington Department of Ecology
Contractor Name?: Landau Associates
Contact: Brett Betts
Notes: Ecology Reference: SY-8
Phone Number:
Date Prepared: January, 1993
Prepared By: Landau Associates

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): N

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
Sample locations are presented using site-specific (i.e. Western Processing) coordinate system

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
metals, SVOCs, pesticides, PCBs, VOAs, AVS, ammonia, pH

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): ?

List methodology: methods not provided

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☒		☒	☒
SVOCs	☒	☒	☐	☒	☒
Pesticides/PCBs	☒	☒	☐	☒	☒
Metals	☒	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
data report appendix

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) Y
If YES, list problems:
numerous data (organic) were rejected or qualified as estimates; metals results were OK

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) N
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
Organic analytes generally exceeded recommended detection limits

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyalella azteca mortality; Chironomus tentans mortlaity and emergence

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM; C. tentans test modified after intial batch due to competition and cannibalism;
second batch consisted of 10 replicates of one organism each.

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) N

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Bioassay QA is not discussed or was available for review

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:

Organic data not acceptable; non-standard methods for Chironomus tentans

Priority for data entry:

☒ High - acceptable data

☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): Lake Union University Regulator CSO Post Separation Study 2000

Date of Survey(s): Apr-00

Location of Master Copy of Survey Report/Data:

Agency: King County

Contractor Name?:

Contact:

Notes: Sedqual code - LUUCSO00

Phone Number:

Date Prepared:

Prepared By: Dean Wilson

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N): ?

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
unknown

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Chironomus tentans, Microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 6 for C. tentans
4 for Microtox

Survey Name: _____

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☐ High - acceptable data ☒ Already entered in Sedqual

☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

Survey Name: _____

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): Lake Washington Baseline Sed Study 2000

Date of Survey(s): Aug-00

Location of Master Copy of Survey Report/Data:

Agency: King County

Contact:

Phone Number:

Date Prepared:

Prepared By: Dean Wilson

Contractor Name?:

Notes: Sedqual code - LKWA00

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Metals, SVOCs, Pesticides, PCBs, PAHs, TOC, Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N): ?

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

Survey Name:

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Sedqual indicates a QA1 was performed.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Chironomus tentans, Hyallela azteca, Microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 8 each for C. tentans and H. azteca; 5 for Microtox

Survey Name: _____

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☐ High - acceptable data ☒ Already entered in Sedqual

☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

Survey Name: _____

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): Lake Sammamish Baseline Sediment Stdy 99

Date of Survey(s): Aug-99

Location of Master Copy of Survey Report/Data:

Agency: King County

Contractor Name?:

Contact:

Notes: Sedqual code - LSAMM99

Phone Number:

Date Prepared:

Prepared By: Dean Wilson

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Metals, SVOCs, Pesticides, PCBs, PAHs, TOC, Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N): ?

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

Survey Name:

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Sedqual indicates a QA1 was performed.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Chironomus tentans, Hyallela azteca, Microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 8 each for C. tentans and H. azteca; 5 for Microtox

Survey Name: _____

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☐ High - acceptable data ☒ Already entered in Sedqual

☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

Survey Name: _____

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): An assessment of metals contamination in Lake Roosevelt

Date of Survey(s): Jun-88

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Olympia,WA

Agency: Washington Department of Ecology

Contractor Name?:

Contact: Art Johnson

Notes: Ecology Reference: SY-7

Phone Number:

Date Prepared: Jun-88

Prepared By: Art Johnson, Dale Norton, Bill Yake

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
metals, conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: EPA 1983; DOE 1983

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☒	☒	☒	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
No QA documentation available

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
No detection limits listed, however metals were detected

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca, Daphnia pulex

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) N

List methodology: Nebeker et. al. 1984; USEPA 1985; Nebeker, et. al. 1986

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) N

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) N

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) N

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) Y

If YES, list problems:

reference sediment had low survival; aeration method may have induced stress in Daphnia test; authors stated that "...bioassay results should not be considered conclusive"

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
bioassay QA: no controls were used and problems noted with reference location

Priority for data entry:

☐ High - acceptable data

☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Chemical Analysis and Toxicity Testing of Spokane River Sediments

Date of Survey(s): Oct-00

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?:

Contact:

Notes:

Phone Number:

Date Prepared: Jul-01

Prepared By: Art Johnson and Dale Norton

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
metals, SVOCs, pesticides, PCBS, conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: SW-846, PSEP

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
data report appendix

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: microtox, Chironomus tentans, Hyalella azteca

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: Adolphson 2000, EPA 2000

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Screening survey for chemical contaminants and toxicity in drainage basins at Paine Field

Date of Survey(s): Aug-87

Location of Master Copy of Survey Report/Data: Washington Department of Ecology

Agency: Washington Department of Ecology

Contractor Name?:

Contact: Dale Norton

Notes: Ecology Reference: SY-6

Phone Number:

Date Prepared: May-89

Prepared By: Art Johnson and Dale Norton

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): N

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
Location information is described only as drainages near Paine Field (I.e., Big Gulch, Japanese Gulch, Powder Mill Gulch, Stickney Lake)

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
metals, SVOCs, pesticides, PCBs, grain size, TOC

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: EPA SW-846, PSEP

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☒	☒	☐	☒	☒
Pesticides/PCBs	☒	☒	☐	☒	☒
Metals	☒	☒	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Section in report

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:
no significant QA problems, however, phthalates were detected in blanks and pentachlorophenol was not recovered in matrix spike

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) N
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
organic analytes generally exceeded recommended detection limits

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca mortality

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 3

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) N

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) N

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

low survival in one sample potentially attributable to difficulty in retrieving test organisms

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☒ All data are rejected. List reasons for data rejection:
low bioassay replication; high detection limits, no positive control or reference

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry:
☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Class II Inspection of the Boise Cascade Pulp and Paper Mill, Wallula, WA

Date of Survey(s): Apr-92

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?

Contact:

Notes: Ecology reference: SY-12

Phone Number:

Date Prepared: Feb-93

Prepared By: A. Johnson and M. Heffner

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
metals, dioxin/furans, SVOCs, pesticides, PCBs, conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: PSEP, EPA SW-846

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☒	☒		☒	☒
SVOCs	☒	☒	☐	☒	☒
Pesticides/PCBs	☒	☒	☐	☒	☒
Metals	☒	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Data Report Appendix; prepared by Manchester Laboratory

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.
Holding time for chromium exceeded; however all data were deemed acceptable for use as qualified

Acceptable detection limits? (Y/N) N
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
elevated detection limits for chromium, copper, lead, ammonia, phenolics, chlorobenzene

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Oncorhynchus mykiss, Pimephales promelas, Daphnia magna, Ceriodaphnia dubia, Hyalella azteca, microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Review of Metals, Bioassay, and Macroinvertebrate data from Lake Roosevelt Benthic Samples collected in 1989

Date of Survey(s): 1989

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?:

Contact:

Notes: Ecology Reference SY-10

Phone Number:

Date Prepared: Dec-91

Prepared By: Art Johnson

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
metals, conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Yes

List methodology: EPA 3050, Plumb 1981, Tetra Tech 1986, Nielson and Sanders 1983, Bloom and Crecelius (1987), Rantala and Lering 1975

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N): Y

- If NO, data for that chemical class is not acceptable.

List metals extraction method: SAD

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
None available for review

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) ?
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
detection limits not provided, but results indicate that reported detections were adequate

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca (mortality), Chironomus tentans (mortality and growth), Daphnia magna (mortality), and Microtox (bioluminescence),

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) N

List methodology: Nebecker et. al. 1984, Tetra Tech, Inc, 1986

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):
Microtox used 3 replicates

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
too much data missing to adequately screen bioassay quality

Priority for data entry:

☐ High - acceptable data

☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Reynolds metal Company Class II inspection

Date of Survey(s): Feb-90

Location of Master Copy of Survey Report/Data: Washington State Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?:

Contact:

Notes: Ecology reference: SY-18

Phone Number:

Date Prepared: 1991

Prepared By: Marc Heffner

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): N

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
hand drawn map and verbal descriptions of sampling locations were included with materials reviewed

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
PAHs, metals, oil & grease, conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: SW-846, APHA 1985, PSEP

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
separate QA report

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) Y
If YES, list problems:
several problems noted regarding metals, including detection limits and sample preparation

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.
not reported, but appear to have been met as per QA report

Acceptable detection limits? (Y/N) N
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
elevated detection limits for metals

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Daphnia magna, microtox, Hyalella azteca

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: EPA 1987, Nebecker 1984, Tetra Tech 1986

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
limited information available regarding bioassay QA/QC

Priority for data entry:

☐ High - acceptable data

☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Kalama Chemical, Inc., Class II inspection

Date of Survey(s): May 1988; September 1988

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contact: Marc Heffenr

Phone Number: (206)895-4740

Date Prepared: Jul-89

Prepared By: Marc Heffenr

Contractor Name?

Notes:

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
conventionals, pesticides, PCBs, metals, VOAs, phenolics

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N)

List methodology: APHA, EPA, PSEP

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
no QA documentation

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) ?
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca, Ceriodaphnia dubia, microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 3

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y
- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y
- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) N
- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for bioassays:
-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☒ All data are rejected. List reasons for data rejection:
no QA documentation; low bioassay replication; non-standard methods

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry:
☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N
- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N
- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Lower Willamette River Reference Area Study

Date of Survey(s):

Location of Master Copy of Survey Report/Data:

Agency: USACE, Portland District

Contractor Name?: Hart Crowser

Contact:

Notes:

Phone Number:

Date Prepared: #######

Prepared By: Hart Crowser, Inc.

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Conventionals, TPH, pesticides, PCBs, metals, organometallics, PAHs, phenolics, phthalates

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: EPA SW-846, PSEP

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method:

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☒	☐	☐	☒	☒
Pesticides/PCBs	☒	☐	☐	☒	☒
Metals	☒	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Data report appendix

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca (survival), Chironomus tentans (survival and growth), Lumbriculus variegatus (bioaccumulation), corbicula fluminea (bioaccumulation)

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM 1996, ASTM 1997, USEPA 1993, USEPA 1994, USEPA 2000

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 8

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) N

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? Y

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Port of Portland Ross Island Site Investigation

Date of Survey(s):

Location of Master Copy of Survey Report/Data:

Agency: Oregon Department of Environmental Quality

Contact:

Phone Number:

Date Prepared: Nov-00

Prepared By: Port of Portland

Contractor Name? Hart Crowser

Notes:

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
conventionals, TBT, SVOC, PAHs, TPH, VOCs, pesticides, PCBs

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: SW-846

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method:

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☒	☒		☒	☒
SVOCs	☒	☒	☐	☒	☒
Pesticides/PCBs	☒	☒	☐	☒	☒
Metals	☒	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Data report appendix; independent data validation by Environmental Synetics

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Elevated ammonia concentrations may be source of observed toxicity

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
Aroclor 1254 detection limits exceeded FSQV in most sediment samples

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca survival; Chironomus tentans survival and growth

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: EPA 2000

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 8

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? Y

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Lake Union Dry Dock sediment monitoring program results.

Date of Survey(s): May-92

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?

Contact:

Notes: Ecology reference: SY-16

Phone Number:

Date Prepared:

Prepared By:

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
VOAs, SVOCs, metals, butyltins, PCBs, TOC, grain size

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: PSEP, SW-846

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☒	☐		☐	☐
SVOCs	☒	☐	☐	☐	☐
Pesticides/PCBs	☒	☒	☐	☒	☒
Metals	☒	☒	☒	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Data report appendix & lab reports

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
PCBs detection limits were elevated

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyalella azteca mortality and growth

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) N

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Cargill Irving Elevator Terminal

Date of Survey(s): Jun-01

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Oregon Department of Environmental Quality

Contact: Jennifer Sutter

Phone Number:

Date Prepared: Oct-01

Prepared By: Harding ESE

Contractor Name? Harding ESE

Notes: Dredged material characterization for potential disposal at Ross Island, Portland, WA

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
PCBs, conventionals, metals, organotins, PAHs, phthalates, phenols, pesticides

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N)

List methodology: SW-846

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method:

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☒	☒	☐	☒	☒
Pesticides/PCBs	☒	☒	☐	☒	☐
Metals	☒	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Data report section

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) N
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.
SVOC extraction holding time was exceeded

Acceptable detection limits? (Y/N) N
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
TBT had elevated detection limits

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca survival; Chironomus tentans survival and growth

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: EPA 2000

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 8

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) N

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) Y

If YES, list problems:

control growth for C. tentans did not meet performance criteria

Holding times met? (Y/N) N

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

recommended holding time exceeded by two weeks

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:

TBT and Chironomus growth results are not useable;
holding time for bioassays exceeded by two weeks

Priority for data entry:

☐ High - acceptable data

☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Sediment Sampling and Analysis Report Cedar River Delta

Date of Survey(s): May-92

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: City of Renton

Contact: David Cotton

Phone Number: (206) 883-0777

Date Prepared: May-92

Prepared By: Golder Associates

Contractor Name?: Golder Associates

Notes: Ecology Reference: SY-9

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.): conventionals metals, SVOCs, pesticides, PCBs, VOAs, PAHs

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: PSEP, EPA, ASTM

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: TAD

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☒	☒		☒	☐
SVOCs	☒	☒	☒	☒	☐
Pesticides/PCBs	☒	☒	☒	☒	☐
Metals	☒	☒	☒	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
data report appendix

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Daphnia magna, microtox, Hyalella azteca

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM (1991); EPA (1985), EPA/DOE (1991), Chapman & Becker (1986)

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 2 (Dapnia); 5 (Hyalella)

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? Y

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Marco Shipyard sediment monitoring results

Date of Survey(s):

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washingotn Department of Ecology

Contractor Name?: Friedman and Bruya

Contact:

Notes:

Phone Number:

Date Prepared: Mar-93

Prepared By: Marco Shipyards

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): N

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
facility location given with descriptions of sampling locations

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
metals, SVOCs, VOAs, TOC, grain size

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: PSEP,. EPA SW-846

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☒	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
none available

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) N
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
SVOCs exceed target detection limits

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca mortality

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 3

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) N

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) N

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
low bioassay replication; no QA documentation; SVOC exceed TDL

Priority for data entry:
☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Biological report on sediment and water bioassays and benthic community determination at Unimar Yard 1 dry dock facility, Seattle, WA

Date of Survey(s): Jan-91

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency:

Contact:

Phone Number:

Date Prepared:

Prepared By: FishPro & GeoEngineers

Contractor Name?: FishPro & GeoEngineers

Notes: Ecology reference: SY-20

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
metals, SVOCs, TPH, PCBs, TBT

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: SW-846

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☒	☒	☐	☒	☐
Pesticides/PCBs	☒	☒	☐	☒	☒
Metals	☒	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
lab report, brief summary in data report

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca 28-d mortality and growth

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM 1989

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 3

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
low bioassay replication

Priority for data entry:
☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? Y

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Sediment Sampling Results for Quendall Terminals Property

Date of Survey(s): May/June 2000

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?: Exponent

Contact:

Notes:

Phone Number:

Date Prepared: Feb-01

Prepared By:

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.): conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: PSEP, EPA

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method:

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
data report appendix

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca, Chironomus tentans, microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: EPA 1994

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 6

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Some sediment samples contained live indigenous species, (chironomids); therefore all samples were frozen to kill organisms and then thawed and re-homogenized

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:

No sediment chemistry other than ammonia, TVS, and total sulfides reported in document reviewed, uncertain whether other sediment chemistry was collected

Priority for data entry:

☒ High - acceptable data

☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Columbia Aluminum Company. Goldendale, Washington. Baseline Sediment Characterization.

Date of Survey(s): Nov-93

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?: ENSR

Contact: Don Reif (Ecology)

Notes: Ecology Reference: SY-34

Phone Number:

Date Prepared: May-94

Prepared By: William Conbere

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.): Metals, PAHs, Ammonia, Sulfide, Total solids, TOC, Grain size, Oil and grease, Fluoride, Cyanide

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: PSEP; EPA methods 200.7, 204.2, 206.2, 213.2, 239.2, 7471, 272.2, 9070, 340.1, 340.2, 9010, 350.3 (modified); 3550 in combination w/C-C/MS Selective Ion Method (SIM)

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Data report (appendix)

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca; Microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM 1383 (modified by Ecology)

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) ?
If NO, test is not acceptable - indicate what test(s):
Replicates performed at least for control and reference stations.

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N*

If YES, list problems:

* Survival in replicates was erratic - lab was unable to explain unusual behavior as all test parameters were acceptable.

Y

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? Y

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Aluminum Company of America. Vancouver Works. Baseline Sediment Characterization.

Date of Survey(s): Sep-93

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency:

Contractor Name? ENSR

Contact: Bill Combere

Notes: Ecology Reference: SY-33

Phone Number: (206) 881-7700

Date Prepared: Jan-94

Prepared By: ENSR

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.): Metals, PCBs, PAHs, TOC, Total solids, Ammonia, Grain size, Cyanide

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: PSEP; EPA Methods 3510, 3540, 8080, 200.7, 204.2, 206.2, 213.2, 239.2, 7471, 272.2, 9070, 340.1, 9010

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method: TAD

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☒	☒	☐	☒	☐
Pesticides/PCBs	☒	☒	☐	☒	☐
Metals	☒	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Lab report

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N*
If YES, list problems:
*No formal data quality review available.

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y*
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
* PCBs exceed target detction limits.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca mortality

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM 1993

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y
- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y
- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y
- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N/A
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for bioassays:
-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N
- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? Y
- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Reconnaissance investigation of water quality bottom sediment, and biota associated with irrigation drainage in the Columbia Basin Project, Washington

Date of Survey(s): 1995

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: USGS,USFWS, Bureau of Reclamation & Indian Affairs

Contractor Name?: EILS

Contact: Elizabeth Block

Notes: Ecology Reference: SY-37

Phone Number: (509) 765-6125

Date Prepared: 1995

Prepared By: SS. Embrey & E.K. Block

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): N

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
none available in report

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.): Metals, Pesticides PCBs, DDTs, TOC, Conventionals, VOAs

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): ?

List methodology: Severson et al (1987), Wershaw et al (1987)

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N): Y

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
limited QA in reports

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N*
If YES, list problems:
Separate QA report not provided

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.
Data not provided

Acceptable detection limits? (Y/N) ?
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
Data not provided

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Chrionomus tentans

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology: Henry & Jaschke (no date); Giesy et al (1988)

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 15

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N*

If YES, list problems:

* QA report not provided

Holding times met? (Y/N) Y*

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

16 samples held in freezer for 27 days before being analyzed.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
Much data is missing; however, the data present appears valid.

Priority for data entry: ☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): McCormick and Baxter Creosoting Company Sediment Remedial Design, Phases I and II.

Date of Survey(s): October 1999, January 2000

Location of Master Copy of Survey Report/Data:

Agency: Oregon Department of Environmental Quality

Contractor Name?: Ecology and Environment

Contact:

Notes:

Phone Number:

Date Prepared: Feb-01

Prepared By: Ecology and Environment

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
Locations can be determined from map

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
arsenic, PCP, PAHs, dioxin/furans, grain size

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: SW-846, ASTM

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method:

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☒	☒	☐	☒	☒
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☒	☒	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
data validation report in appendix

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca survival, Chironomus tentans survival and growth

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: EPA 2000

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 8

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

1) controls for H azteca in Phase I did meet performance criteria and were re-tested;

2) samples exceeded holding temperatures when received by bioassay laboratory

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

re-tested H. azteca bioassay intiated one month after samples were collected

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? Y

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s) Lake Roosevelt Sediment TMDL Study (Draft)

Date of Survey(s) Nov-02

Location of Master Copy of Survey Report/Data Washington Department of Ecology, Lacy, WA

Agency Washington Department of Ecology

Contractor Name?

Contact

Notes: Sedqual code : LKROOS01

Phone Number

Date Prepared Nov-01 Draft

Prepared By Dave Serder

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.): Metals; TOC; Mercury; Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: EPA 3050/6010B; EPA 245.5; EPA 1996 (combustion/Co2), (gravametric), (sieve & pipet)

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☒	☒	☒	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Separate data reports for metals and Microtox

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyalella & Chironomus; Microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: EPA 100.5; ASTM E-1706 and 100 (EPA); Ecology Protocol (Adolphson 2000)

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 8

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

DO in WQ beaker fell below 2.5 mg/L on day 14.

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Review of Sediment Quality Data for the Similkameen River

Date of Survey(s): Jul-00

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?: CH2MHill, Manchester Lab

Contact: Art Johnson

Notes: Sedqual code : SIMILK00

Phone Number:

Date Prepared: Jul-00

Prepared By:

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.): Metals; TOC; SVOCs; Pesticides; PCBs; Conventionals; Cyanide

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: PSEP; SW3050/6010; SW 3050/7421; SW 3050/7740; SW 3050/7841; EPA 245.5; SM 4500CNL; SW 8270; SW 8081-82; SW 8085; SW 8290/EPA 1613B

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☒	☒	☒	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Separate QA report.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) Y
If YES, list problems:
Method blank for SVOCs was contaminated with several compounds.

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyalella; Microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM E1383-90; Microtox M500 manual

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) ?
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? ?

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
Report is not clear about positive and negative control data for bioassays.

Priority for data entry:
☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? limited

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): Tri-Star Marine NPDES Sediment Monitoring

Date of Survey(s): May-97

Location of Master Copy of Survey Report/Data:

Agency: Ecology

Contact:

Phone Number:

Date Prepared:

Prepared By: David B. Hericks

Contractor Name?:

Notes: Sedqual code - TRI-STAR

No hard copy.

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Metals, SVOCs, Pesticides, PCBs, PAHs, TOC, Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: 3550A/SIM, KRONE 1998, PSEP protocols, Plumb 1981, EPA 200.8, 3550A/8080A
EPA 160.3, EPA 160.4 (modifiied), EPA 7471A, EPA 9071, PSEP protocols

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
unknown

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
Some values appear high, but appear to be properly qualified.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyallela azteca, Microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) ?
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry:

☒ High - acceptable data

☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): Spokane River PCB Bioassay Study

Date of Survey(s): Aug-94

Location of Master Copy of Survey Report/Data:

Agency: Ecology

Contact:

Phone Number:

Date Prepared:

Prepared By: David Batts

Contractor Name?:

Notes: Sedqual code - SPOKNR94

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Metals, SVOCs, Pesticides, PCBs, PAHs, TOC, Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): ?

List methodology: Inductively Coupled Plasma AA

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N): ?

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

Survey Name:

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
unknown

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyallela azteca, Microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5 each

Survey Name:

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☐ High - acceptable data ☒ Already entered in Sedqual

☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

Survey Name: _____

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): Everett Simpson Site Sediment Investigat

Date of Survey(s): Jun-94

Location of Master Copy of Survey Report/Data:

Agency: WA Ecology; TCP; NWRO

Contractor Name?:

Contact:

Notes: Sedqual code - EVRTSM94

Phone Number:

Date Prepared:

Prepared By: Teresa Michelson

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y (mercury only)

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Mercury

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N): ?

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

Survey Name:

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
unknown

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Chironomus tentans, Hyallela azteca

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

Survey Name: _____

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry:

☐ High - acceptable data

☐ Low - problems noted

☒ Already entered in Sedqual

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

Survey Name: _____

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Port of Vancouver Results of Daphnia magna Sediment Bioassays

Date of Survey(s): Nov-89

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?: EILS

Contact: Margaret Stinson

Notes: Ecology Reference: SY-35

Phone Number:

Date Prepared: Jan-90

Prepared By:

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): N

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
none available in report

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.): Metals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: ICP

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
?

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N*
If YES, list problems:
QA report not provided

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.
Data not provided

Acceptable detection limits? (Y/N) ?
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
Data not provided

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Daphnia

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: Nebeker et al (1984)

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 2

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N*

If YES, list problems:

* QA report not provided

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

Data not provided

SUMMARY:

☐ All data are accepted.

☒ All data are rejected. List reasons for data rejection:
Too much data missing.

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): Sediment Study Marine Terminals 2 and 4

Date of Survey(s): Jan-98

Location of Master Copy of Survey Report/Data:

Agency: Port of Portland

Contractor Name?:

Contact:

Notes: Sedqual code - PPTLDT24

Phone Number:

Date Prepared:

Prepared By: Sebastian Degens

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Metals, SVOCs, Pesticides, PCBs, PAHs, TOC, Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: EPA 160.4MOD, EPA 350.1M, 3550A/SIM, ASTM D4129-82, EPA 200.8, EPA 7471A, EPA 8081 (modified), EPA SW8082 GC-ECD, EPA SW-846 Method 8260 Modified, PSEP protocols

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Sedqual Indicates QA1 was performed.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
Some values appear high, but appear to be properly qualified.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyalella azteca, Chironomus tentans

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) ?
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 8

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y
- If NO, data for that bioassay is not acceptable.
Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Longview Fibre Company Class II Inspection

Date of Survey(s): May-90

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?:

Contact: Tapas Das

Notes: Ecology reference: SY-24

Phone Number:

Date Prepared: Apr-91

Prepared By: Tapas Das

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): N

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
No sampling location information provided

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
metals, pesticides, PCBs, PAHs, conventionals, SVOCs

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): N

List methodology: EPA 1979, APHA 1985

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N): Y

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☒	☒		☒	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☒	☐	☐	☐	☐
Metals	☒	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
data report appendix

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: microtox, Ceriodaphnia dubia, Hyalella azteca, Daphnia magna

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) N

List methodology: Beckman 1982, EPA, Nebecker 1984, Ecology 1981

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) N
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
Incomplete information regarding bioassay data quality; non-standard methods

Priority for data entry:
☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): Willamette River Data

Date of Survey(s): Jan-98

Location of Master Copy of Survey Report/Data:

Agency: Cascade General

Contractor Name?:

Contact:

Notes: Sedqual code - WRD&M98

Phone Number:

Date Prepared:

Prepared By: Dames & Moore

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Metals, SVOCs, Pesticides, PCBs, PAHs, TOC, Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N): N

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Sedqual Indicates QA2 was performed.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
Some values appear high, but appear to be properly qualified.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyalella azteca

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) ?
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y
- If NO, data for that bioassay is not acceptable.
Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): Portland Shipyard Env. Audit

Date of Survey(s): Nov-97

Location of Master Copy of Survey Report/Data:

Agency: Cascade General

Contractor Name?:

Contact:

Notes: Sedqual code - PSYD&M97

Phone Number:

Date Prepared:

Prepared By: Dames & Moore

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
Metals, SVOCs, Pesticides, PCBs, PAHs, TOC, Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N): N

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Sedqual Indicates QA2 was performed.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
Some values appear high, but appear to be properly qualified.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Hyalella azteca

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) ?
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y
- If NO, data for that bioassay is not acceptable.
Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☒ High - acceptable data
☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? ?

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Columbia Slough Sediment Analysis and Remediation Project

Date of Survey(s): Dec-91

Location of Master Copy of Survey Report/Data: Washington Department of Ecology

Agency: City of Portland Bureau of Environmental Services

Contractor Name?: Dames and Moore

Contact: K. Perry Campbell

Notes: Ecology Reference: SY-2

Phone Number: (509) 946-4833

Date Prepared: Aug-81

Prepared By: Dames and Moore

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): N

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
dummy coordinates could be assigned based on locations plotted on aerial photos

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
VOA; PAHs; PCBs; pesticides; metals; dioxin; organics; conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: PSEP; SW-846

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method:

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☒	☒		☒	☐
SVOCs	☒	☒	☐	☒	☐
Pesticides/PCBs	?	?	☐	?	☐
Metals	?	?	☐	?	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
No QA report available

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
results appear to be consistant with SAPA; however lab detection limits not provided

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca mortality

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
Data missing (i.e., Appendix D), and not available for screening

Priority for data entry:

☐ High - acceptable data

☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? ?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? Y

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Report of findings: Phase II Columbia River Impact Investigation, Vancouver, WA

Date of Survey(s): May-89

Location of Master Copy of Survey Report/Data: Washingotn Department of Ecology, Lacy, WA

Agency: _____

Contact: _____

Phone Number: _____

Date Prepared: 1989

Prepared By: Port of Vancouver

Contractor Name? Century West Engineering Corp.

Notes: a previous review indicated that bioassay data should be rejected

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N) Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N) N

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
figures missing from document available for review

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
metals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N) Y

List methodology: EPA SW-846

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) _____

- If NO, data for that chemical class is not acceptable.

List metals extraction method: SAD

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
limited QA discussion in report reviewed

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) ?
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: acute fish bioassay

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) N

List methodology:

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) N
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 3

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☒ All data are rejected. List reasons for data rejection:
too much missing information; non-standard bioassay

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry:
☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Survey of Contaminated Sediments in Lake Union & Adjoining Waters

Date of Survey(s):

Location of Master Copy of Survey Report/Data: Washington Department of Ecology

Agency: Washington Department of Ecology

Contractor Name?:

Contact:

Notes: Ecology Reference: SY-5

Phone Number:

Date Prepared: Aug-92

Prepared By: James Cubbage

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
VOA; SVOCs; Pesticides; PCBs; metals; TOC; and grain size

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: PSEP; CLP

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: SAD

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☒	☒		☒	☒
SVOCs	☒	☒	☐	☒	☒
Pesticides/PCBs	☒	☒	☐	☒	☒
Metals	☒	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Data report appendix

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) N
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.
Samples for PAH & PCB analysis were extracted within 2 week holding period; but the extracts were not analyzed within 40-day holding time and should be qualified as estimates

Acceptable detection limits? (Y/N) N
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.
Detection limits for pesticides, PCBs, SVOCs and As were elevated

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Microtox, Daphnia magna mortality; Hyalella azteca mortality

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM 1990; EPA 1986

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) N

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
Detection limits and holding times for sediment chemistry exceeded acceptance limits.

Priority for data entry:

☐ High - acceptable data

☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? Y

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Information collected from Sedqual - No hard copy reviewed

Survey Name(s) and Location(s): BNSF Skykomish River Site

Date of Survey(s): Jul-01

Location of Master Copy of Survey Report/Data:

Agency: BNSF

Contractor Name?:

Contact:

Notes: Sedqual code - BNSFSK02

Phone Number:

Date Prepared:

Prepared By: Halah Voges

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): N*

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

*Station lats and longs were estimated with Sedqual DD tool using Arc View and orthophoto of Town of Skykomish. Station positions submitted by Retec in lat and longs and state plane coordinates could not be successfully plotted to correct locations.

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
TOC, Conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: EPA 160.3 ;EPA 160.4MOD; EPA 350.1M; EPA 376.2; Plumb 1981;PSEP protocols; WA Dept of Ecology method

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☐	☐	☐	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:
List bioassay tests conducted: Chironomus tentans, Hyallela azteca, Microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology: Inductively Coupled Plasma AA

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) N
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:
Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5 each

Survey Name: _____

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry: ☐ High - acceptable data ☒ Already entered in Sedqual

☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)?

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)?

- Refer to data acquisition checklist.

Survey Name: _____

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Effects of PAHs in sediments from Lake Washington on freshwater bioassay organisms and benthic macroinvertebrates

Date of Survey(s): May 1990 and February 1991

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?:

Contact:

Notes:

Phone Number:

Date Prepared: Jun-92

Prepared By: J. Bennett & J. Cubbage

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
conventionals, PAHS, pentachlorophenol

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: PSEP 1987, EPA 1986

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method: ?

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☒	☒		☒	☒
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☒	☒	☐	☒	☒
Metals	☒	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
data report appendix

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Daphnia magna, Hyalella azteca, Ceriodaphnia dubia, Hexagenia limbata, Chironomus tentans, microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM 1990, Nebeker 1984, Mosher, et. al. 1982

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N) Y
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) ?

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

All data considered acceptable

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☒ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☐ Partial data acceptance. List rejected data classes and reason for rejection:

Priority for data entry:

☒ High - acceptable data

☐ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? Y

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): Copper in sediments from Steilacoom Lake, Pierce County, WA

Date of Survey(s): Nov-90

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?:

Contact:

Notes: Ecology reference: SY-13

Phone Number:

Date Prepared: Jun-92

Prepared By: J. Bennett and J. Cubbage

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
metals, conventionals

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: EPA SW846

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)

- If NO, data for that chemical class is not acceptable.

List metals extraction method: TAD

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☐	☐		☐	☐
SVOCs	☐	☐	☐	☐	☐
Pesticides/PCBs	☐	☐	☐	☐	☐
Metals	☐	☒	☐	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
Data report appendix

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N
If YES, list problems:

Holding times met? (Y/N) ?
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Daphnia magna, Ceriodaphnia dubia, Hyalella azteca, Chironomus tentans, Hexagenia, Microtox

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) Y

List methodology: ASTM 1990, USEPA 1986

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 6

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) ?

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) Y

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) N

If YES, list problems:

Hexagenia limbata bioassay results were discarded due to low survival in control sediment

Holding times met? (Y/N) Y

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

Yes for Hyalella azteca; uncertain for other bioassays

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:

Cannot verify holding times

Priority for data entry:

☐ High - acceptable data

☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? Y

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

FRESHWATER SEDIMENT DATA SCREENING CRITERIA

Survey Name(s) and Location(s): ALCOA Class II Inspection

Date of Survey(s): Jan-90

Location of Master Copy of Survey Report/Data: Washington Department of Ecology, Lacy, WA

Agency: Washington Department of Ecology

Contractor Name?:

Contact:

Notes: Ecology reference: SY-25

Phone Number:

Date Prepared: Dec-90

Prepared By: Lisa Zinner

SYNOPTIC DATA SET:

Are chemistry and bioassay results included? (Y/N): Y

- If NO, data set is not acceptable

Are location data (e.g., latitude/longitude) acceptable, or can they be determined from a map? (Y/N): Y

If NO, describe status of location data ("dummy" coordinates may be assigned if QA is acceptable):
sampling locations are listed as a fixed distance from a surveyed point

SEDIMENT CHEMISTRY ANALYSIS METHODS:

List classes of chemical analyzed (e.g., metals, VOAs, PAHs, Pest/PCBs, etc.):
VOA's, metals, SVOCs, pesticides, PCBs

Are standardized chemical analysis methods used (e.g., PSEP, SW-846, CLP)? (Y/N): Y

List methodology: SW-846

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N):

- If NO, data for that chemical class is not acceptable.

List metals extraction method: SAD

- Either Strong Acid Digestion (SAD) or Total Acid Digestion (TAD) is acceptable.

SEDIMENT QA PROCEDURES:

Recommended laboratory QA/QC requirements are provided below. Indicate QA/QC conducted:

Analysis Type	Method Blanks	Replicates	CRM	Matrix Spike	Surrogates
VOAs	☒	☒		☒	☐
SVOCs	☒	☒	☒	☒	☐
Pesticides/PCBs	☒	☒	☒	☒	☐
Metals	☒	☒	☒	☒	

- Omission of some QA/QC may not necessarily result in data rejection.
Additional review may be necessary on a case by case basis.

SEDIMENT QA PROCEDURES (Continued):

Indicate what QA documention reviewed (e.g., data report appendix, separate QA report):
none provided

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?
If YES, list problems:

Holding times met? (Y/N) Y
If NO, list holding time exceedance for classes of chemicals:
-Data with gross holding time exceedances are rejected.

Acceptable detection limits? (Y/N) Y
-Refer to Ecology's SAPA detection limits.
If NO, list problems noted:
-Data should be appropriately qualified or data are rejected.

BIOASSAY ANALYSIS METHODS:

List bioassay tests conducted: Hyalella azteca mortality

Modern (post-1985) or standardized bioassay protocols used (e.g., ASTM, PSEP)? (Y/N) ?

List methodology: not provided

If nonstandard method, is reference provided or can methods be obtained for review? (Y/N)
- If NO, data set is not acceptable.

BIOASSAY QA PROCEDURES:

Replicate treatments used for all bioassay tests? (Y/N) Y
If NO, test is not acceptable - indicate what test(s):

If YES, what are the minimum number of replicates conducted per test? 5

BIOASSAY QA PROCEDURES (Continued):

Negative bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Positive bioassay control run (minimum of one per batch)? (Y/N) Y

- If NO, data for that bioassay is not acceptable.

Bioassay reference run? (Y/N) N

- Not a criteria for acceptance or rejection.

Does QA Report (e.g., QA1) indicate significant problems? (Y/N) ?

If YES, list problems:

Holding times met? (Y/N) ?

If NO, list holding time exceedance for bioassays:

-data with gross holding time exceedances are rejected.

SUMMARY:

☐ All data are accepted.

☐ All data are rejected. List reasons for data rejection:

☒ Partial data acceptance. List rejected data classes and reason for rejection:
Incomplete information; limited data; likely to be acceptable

Priority for data entry:
☐ High - acceptable data
☒ Low - problems noted

Is there sufficient QA documentation to conduct a QA1 data review (Y/N)? N

- Refer to data acquisition checklist.

Is there sufficient QA documentation to conduct a QA2 data review (Y/N)? N

- Refer to data acquisition checklist.

Sedqual References

BNSF. 2002. BNSF Skykomish River Site. July 2001. Sedqual code - BNSFSK02.

Dames and Moore. 1997. Portland Shipyard Environmental Audit, Cascade General. Portland Shipyard Environmental Audit Appendix D Dames & Moore Data. Sedqual code - PSYD&M97.

Dames and Moore. 1998. Willamette River Data. Portland Shipyard Environmental Audit Appendix D Dames & Moore Data. Sedqual code - WRD&M98.

Degens. 1998. Sediment Characterization Study, Marine Terminal 2 Berths 203-206 and Marine Terminal 4 Berth 416. Sedqual code - PPTLDT24.

Ecology. 1994a. Everett Simpson Site Sediment Investigation. June 1994. Sedqual code - EVRTSM94.

Ecology. 1994b. Spokane River PCB Bioassay Study. August 1994. Sedqual code - SPOKNR94.

Ecology. 1997. Tri-Star Marine NPDES Sediment Monitoring. Sedqual code - TRI-STAR.

King County. 1999. Lake Sammamish Baseline Sediment Study. August 1999. Sedqual code - LSAMM99.

King County. 2000a. Lake Washington Baseline Sediment Study 2000. August 2000. Sedqual code - LKWA00.

King County. 2000B. Lake Union University Regulator CSO Post Separation Study 2000. April 2000. Sedqual code - LUUCSO00.

Quinn. 1998. Terminal 4 Slip 3 Sediment Investigation. Marine Terminal 2 Berths 203-206 and Marine Terminal 4 Berth 416. Sedqual code - WLRPT498.

Striplin. 1998. Portland Shipyard Sediment Investigation Data Report. Sedqual code - PSYSEA98.

Tetra Tech. 1993. Lower Columbia Backwater Recon. Survey. June, 1993. Sedqual code - LCBWRS93.

Tosco. 1997. TOSCO Sediment Sampling Results 1999. Sedqual code - TOSCO99.

APPENDIX K

"Reliability" worksheets
for
Comparison Among SQV Sets

This appendix includes summary results of the reliability assessment from the Reliability worksheets for each of the nine reliability runs. The associated Excel files (listed at the top of each worksheet) include all the backup information for these results, as well as the chemical criteria associated with each of the SQV sets. The Excel files and SEDQUAL database used to calculate these results are provided in the attached CD.

FWReliability-CSLcon.xls

SQG Set	False Negatives (%) (number of FNs)	False Positives (%) (number of FPs)	Sensitivity	2002 Efficiency	1988 Efficiency (cor.pred.hits/pred.hits)	Reliability (number correct)
LAET	**32**	**48**	**68**	**52**	**37**	**57**
	36	133			77	221
					210	
LPAET	**30**	**52**	**70**	**48**	**35**	**54**
	34	144			79	212
					223	
TEL	**4**	**90**	**96**	**10**	**30**	**35**
	5	248			108	137
					356	
PEL	**30**	**51**	**70**	**49**	**36**	**55**
	34	142			79	214
					221	
TEC	**12**	**80**	**88**	**20**	**31**	**40**
	14	221			99	155
					320	
PEC	**38**	**40**	**62**	**60**	**39**	**61**
	43	111			70	236
					181	
LEL	**5**	**85**	**95**	**15**	**31**	**38**
	6	236			107	148
					343	
SEL	**42**	**31**	**58**	**69**	**44**	**66**
	47	85			66	258
					151	

Biohits:	113
Nohits:	277
Stations:	390

Notes:

False Negatives = incorrectly predicted no-hits/total hits

False Positives = incorrectly predicted hits/total no-hits

Sensitivity = correctly predicted hits/total hits = 100% - false negatives

2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives

1988 Efficiency = correctly predicted hits/total predicted hits

Reliability = correct predictions/total stations

FWReliability-CSLref.xls

SQG Set	False Negatives (%) (number of FNs)	False Positives (%) (number of FPs)	Sensitivity	2002 Efficiency	1988 Efficiency (cor.pred.hits/pred.hits)	Reliability (number correct)
LAET	**23**	**50**	**77**	**50**	**36**	**57**
	15	88			49	136
					137	
LPAET	**20**	**55**	**80**	**45**	**35**	**54**
	13	96			51	130
					147	
TEL	**5**	**90**	**95**	**10**	**28**	**33**
	3	158			61	78
					219	
PEL	**16**	**54**	**84**	**46**	**36**	**56**
	10	94			54	135
					148	
TEC	**6**	**83**	**94**	**17**	**29**	**37**
	4	146			60	89
					206	
PEC	**27**	**41**	**73**	**59**	**40**	**63**
	17	71			47	151
					118	
LEL	**9**	**85**	**91**	**15**	**28**	**35**
	6	149			58	84
					207	
SEL	**33**	**34**	**67**	**66**	**42**	**66**
	21	60			43	158
					103	

Notes:	Biohits:	64
False Negatives = incorrectly predicted no-hits/total hits	Nohits:	175
False Positives = incorrectly predicted hits/total no-hits	Stations:	239

Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-CSLrefcon.xls

SQG Set	False Negatives (%) (number of FNs)	False Positives (%) (number of FPs)	Sensitivity	2002 Efficiency	1988 Efficiency (cor.pred.hits/pred.hits)	Reliability (number correct)
LAET	**33**	**49**	**67**	**51**	**34**	**55**
	36	138			72	216
					210	
LPAET	**31**	**53**	**69**	**47**	**33**	**53**
	34	149			74	207
					223	
TEL	**6**	**90**	**94**	**10**	**28**	**33**
	7	255			101	128
					356	
PEL	**30**	**51**	**70**	**49**	**34**	**55**
	32	145			76	213
					221	
TEC	**14**	**80**	**86**	**20**	**29**	**38**
	15	227			93	148
					320	
PEC	**38**	**40**	**62**	**60**	**37**	**60**
	41	114			67	235
					181	
LEL	**9**	**87**	**91**	**13**	**29**	**35**
	10	245			98	135
					343	
SEL	**42**	**31**	**58**	**69**	**42**	**66**
	45	88			63	257
					151	

Notes:	Biohits:	108
False Negatives = incorrectly predicted no-hits/total hits	Nohits:	282
False Positives = incorrectly predicted hits/total no-hits	Stations:	390

Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-SQScon.xls

SQG Set	False Negatives (%) (number of FNs)	False Positives (%) (number of FPs)	Sensitivity	2002 Efficiency	1988 Efficiency (cor.pred.hits/pred.hits)	Reliability (number correct)
LAET	**33**	**42**	**67**	**58**	**58**	**62**
	60	88			122	242
					210	
LPAET	**31**	**47**	**69**	**53**	**56**	**60**
	57	98			125	235
					223	
TEL	**4**	**88**	**96**	**13**	**49**	**51**
	8	182			174	200
					356	
PEL	**40**	**53**	**60**	**47**	**50**	**53**
	72	111			110	207
					221	
TEC	**13**	**78**	**87**	**22**	**49**	**52**
	24	162			158	204
					320	
PEC	**47**	**40**	**53**	**60**	**54**	**57**
	85	84			97	221
					181	
LEL	**5**	**82**	**95**	**18**	**50**	**54**
	9	170			173	211
					343	
SEL	**50**	**29**	**50**	**71**	**60**	**61**
	91	60			91	239
					151	

Notes:	Biohits:	182
False Negatives = incorrectly predicted no-hits/total hits	Nohits:	208
False Positives = incorrectly predicted hits/total no-hits	Stations:	390

Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-SQSref.xls

SQG Set	False Negatives (%) (number of FNs)	False Positives (%) (number of FPs)	Sensitivity	2002 Efficiency	1988 Efficiency (cor.pred.hits/pred.hits)	Reliability (number correct)
LAET	**33**	**50**	**67**	**50**	**49**	**57**
	33	70			67	136
					137	
LPAET	**30**	**55**	**70**	**45**	**48**	**55**
	30	77			70	132
					147	
TEL	**8**	**91**	**92**	**9**	**42**	**44**
	8	127			92	104
					219	
PEL	**29**	**55**	**71**	**45**	**48**	**56**
	29	77			71	133
					148	
TEC	**12**	**85**	**88**	**15**	**43**	**46**
	12	118			88	109
					206	
PEC	**43**	**44**	**57**	**56**	**48**	**56**
	43	61			57	135
					118	
LEL	**16**	**88**	**84**	**12**	**41**	**42**
	16	123			84	100
					207	
SEL	**45**	**35**	**55**	**65**	**53**	**61**
	45	48			55	146
					103	

Notes:	Biohits:	100
False Negatives = incorrectly predicted no-hits/total hits	Nohits:	139
False Positives = incorrectly predicted hits/total no-hits	Stations:	239

Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-SQSrefcon.xls

SQG Set	False Negatives (%) (number of FNs)	False Positives (%) (number of FPs)	Sensitivity	2002 Efficiency	1988 Efficiency (cor.pred.hits/pred.hits)	Reliability (number correct)
LAET	**39**	**48**	**61**	**52**	**49**	**56**
	65	108			102	217
					210	
LPAET	**37**	**53**	**63**	**47**	**47**	**54**
	62	118			105	210
					223	
TEL	**8**	**91**	**92**	**9**	**43**	**44**
	14	203			153	173
					356	
PEL	**40**	**54**	**60**	**46**	**46**	**52**
	66	120			101	204
					221	
TEC	**19**	**83**	**81**	**17**	**43**	**45**
	31	184			136	175
					320	
PEC	**50**	**43**	**50**	**57**	**46**	**54**
	83	97			84	210
					181	
LEL	**13**	**89**	**87**	**11**	**42**	**44**
	22	198			145	170
					343	
SEL	**52**	**32**	**48**	**68**	**53**	**59**
	87	71			80	232
					151	
Notes:					Biohits:	167
False Negatives = incorrectly predicted no-hits/total hits					Nohits:	223
False Positives = incorrectly predicted hits/total no-hits					Stations:	390

Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-STATcon.xls

SQG Set	False Negatives (%) (number of FNs)	False Positives (%) (number of FPs)	Sensitivity	2002 Efficiency	1988 Efficiency (cor.pred.hits/pred.hits)	Reliability (number correct)
LAET	**36**	**38**	**64**	**62**	**72**	**63**
	84	59			151	247
					210	
LPAET	**32**	**41**	**68**	**59**	**71**	**64**
	76	64			159	250
					223	
TEL	**4**	**85**	**96**	**15**	**63**	**64**
	10	131			225	249
					356	
PEL	**41**	**54**	**59**	**46**	**62**	**54**
	97	83			138	210
					221	
TEC	**11**	**72**	**89**	**28**	**65**	**64**
	27	112			208	251
					320	
PEC	**48**	**37**	**52**	**63**	**68**	**56**
	112	58			123	220
					181	
LEL	**5**	**77**	**95**	**23**	**65**	**67**
	11	119			224	260
					343	
SEL	**53**	**26**	**47**	**74**	**74**	**58**
	124	40			111	226
					151	
Notes:					Biohits:	235
False Negatives = incorrectly predicted no-hits/total hits					Nohits:	155
False Positives = incorrectly predicted hits/total no-hits					Stations:	390

Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-STATref.xls

SQG Set	False Negatives (%) (number of FNs)	False Positives (%) (number of FPs)	Sensitivity	2002 Efficiency	1988 Efficiency (cor.pred.hits/pred.hits)	Reliability (number correct)
LAET	**35**	**49**	**65**	**51**	**59**	**58**
	44	56			81	139
					137	
LPAET	**32**	**54**	**68**	**46**	**58**	**57**
	40	62			85	137
					147	
TEL	**8**	**91**	**92**	**9**	**53**	**52**
	10	104			115	125
					219	
PEL	**31**	**54**	**69**	**46**	**58**	**58**
	39	62			86	138
					148	
TEC	**14**	**86**	**86**	**14**	**52**	**52**
	17	98			108	124
					206	
PEC	**45**	**43**	**55**	**57**	**58**	**56**
	56	49			69	134
					118	
LEL	**17**	**90**	**83**	**10**	**50**	**48**
	21	103			104	115
					207	
SEL	**48**	**33**	**52**	**67**	**63**	**59**
	60	38			65	141
					103	

Notes:	Biohits:	125
False Negatives = incorrectly predicted no-hits/total hits	Nohits:	114
False Positives = incorrectly predicted hits/total no-hits	Stations:	239

Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-STATrefcon.xls

SQG Set	False Negatives (%) (number of FNs)	False Positives (%) (number of FPs)	Sensitivity	2002 Efficiency	1988 Efficiency (cor.pred.hits/pred.hits)	Reliability (number correct)
LAET	**44**	**50**	**56**	**50**	**61**	**54**
	99	82			128	209
					210	
LPAET	**40**	**53**	**60**	**47**	**61**	**54**
	91	87			136	212
					223	
TEL	**7**	**90**	**93**	**10**	**59**	**58**
	17	146			210	227
					356	
PEL	**46**	**61**	**54**	**39**	**55**	**48**
	105	99			122	186
					221	
TEC	**17**	**81**	**83**	**19**	**59**	**56**
	39	132			188	219
					320	
PEC	**56**	**49**	**44**	**51**	**56**	**47**
	126	80			101	184
					181	
LEL	**12**	**88**	**88**	**12**	**58**	**56**
	28	144			199	218
					343	
SEL	**59**	**35**	**41**	**65**	**62**	**51**
	133	57			94	200
					151	

Notes:	Biohits:	227
False Negatives = incorrectly predicted no-hits/total hits	Nohits:	163
False Positives = incorrectly predicted hits/total no-hits	Stations:	390

Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

APPENDIX L

Floating Percentile "FPCalc" Worksheets

This appendix includes summary results of the floating percentile calculations from the FPCalc worksheets for each of the nine reliability runs. The associated Excel files (listed at the top of each worksheet) include all the backup information for these results. The Excel files and SEDQUAL database used to calculate these results are provided in the attached CD.

FWReliability-CSLcon.xls

% False Negatives	% False Positives	% Sensitivity	% 2002 Efficiency	% 1988 Efficiency	% Reliability
4	**77**	**96**	**23**	**34**	**44**
4	84	96	16	32	39
10	**62**	**90**	**38**	**37**	**53**
10	70	90	30	34	47
14	**55**	**86**	**45**	**39**	**57**
12	68	88	32	34	48
19	**44**	**81**	**56**	**43**	**63**
19	56	81	44	37	55
25	**39**	**75**	**61**	**44**	**65**
23	48	77	52	39	59
29	**27**	**71**	**73**	**52**	**73**
27	42	73	58	41	62

Unbolded values = initial reliability of starting percentiles **Bolded** values = reliability after floating percentile calculations

Notes:

False Negatives = incorrectly predicted no-hits/total hits
False Positives = incorrectly predicted hits/total no-hits
Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-CSLref.xls

% False Negatives	% False Positives	% Sensitivity	% 2002 Efficiency	% 1988 Efficiency	% Reliability
5	**75**	**95**	**25**	**32**	**44**
5	89	95	11	28	33
9	**64**	**91**	**36**	**34**	**51**
9	79	91	21	29	39
14	**54**	**86**	**46**	**37**	**56**
14	70	86	30	31	45
19	**37**	**81**	**63**	**45**	**68**
19	54	81	46	35	55
25	**31**	**75**	**69**	**47**	**70**
25	46	75	54	38	60
30	**23**	**70**	**77**	**53**	**75**
30	41	70	59	38	62

Unbolded values = initial reliability of starting percentiles **Bolded** values = reliability after floating percentile calculations

Notes:

False Negatives = incorrectly predicted no-hits/total hits
False Positives = incorrectly predicted hits/total no-hits
Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-CSLrefcon.xls

% False Negatives	% False Positives	% Sensitivity	% 2002 Efficiency	% 1988 Efficiency	% Reliability
5	**81**	**95**	**19**	**31**	**40**
4	92	96	8	29	32
9	**66**	**91**	**34**	**35**	**50**
9	81	91	19	30	39
15	**61**	**85**	**39**	**35**	**52**
15	67	85	33	33	47
19	**45**	**81**	**55**	**41**	**62**
19	57	81	43	35	53
25	**38**	**75**	**62**	**43**	**66**
24	50	76	50	37	57
30	**34**	**70**	**66**	**44**	**67**
28	46	72	54	38	59

Unbolded values = initial reliability of starting percentiles **Bolded** values = reliability after floating percentile calculations

Notes:

False Negatives = incorrectly predicted no-hits/total hits
False Positives = incorrectly predicted hits/total no-hits
Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-SQScon.xls

% False Negatives	% False Positives	% Sensitivity	% 2002 Efficiency	% 1988 Efficiency	% Reliability
5	**75**	**95**	**25**	**52**	**57**
5	83	95	17	50	53
10	**68**	**90**	**32**	**54**	**59**
10	73	90	27	52	57
15	**59**	**85**	**41**	**56**	**62**
15	65	85	35	53	58
20	**56**	**80**	**44**	**56**	**61**
20	62	80	38	53	58
25	**47**	**75**	**53**	**59**	**64**
25	52	75	48	56	61
30	**37**	**70**	**63**	**63**	**67**
29	47	71	53	57	62

Unbolded values = initial reliability of starting percentiles **Bolded** values = reliability after floating percentile calculations

Notes:

False Negatives = incorrectly predicted no-hits/total hits
False Positives = incorrectly predicted hits/total no-hits
Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-SQSref.xls

% False Negatives	% False Positives	% Sensitivity	% 2002 Efficiency	% 1988 Efficiency	% Reliability
5	**83**	**95**	**17**	**45**	**49**
4	95	96	5	42	43
10	**86**	**90**	**14**	**43**	**46**
10	88	90	12	42	45
15	**76**	**85**	**24**	**45**	**50**
15	86	85	14	42	44
20	**63**	**80**	**37**	**48**	**55**
20	82	80	18	41	44
25	**53**	**75**	**47**	**51**	**59**
25	68	75	32	44	50
30	**42**	**70**	**58**	**55**	**63**
29	55	71	45	48	56

Unbolded values = initial reliability of starting percentiles **Bolded** values = reliability after floating percentile calculations

Notes:

False Negatives = incorrectly predicted no-hits/total hits
False Positives = incorrectly predicted hits/total no-hits
Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-SQSrefcon.xls

% False Negatives	% False Positives	% Sensitivity	% 2002 Efficiency	% 1988 Efficiency	% Reliability
5	**85**	**95**	**15**	**46**	**49**
4	92	96	8	44	45
10	**80**	**90**	**20**	**46**	**50**
10	85	90	15	44	47
15	**75**	**85**	**25**	**46**	**51**
14	82	86	18	44	47
20	**64**	**80**	**36**	**49**	**55**
20	72	80	28	45	50
25	**58**	**75**	**42**	**49**	**56**
24	68	76	32	46	51
30	**48**	**70**	**52**	**52**	**60**
29	57	71	43	48	55

Unbolded values = initial reliability of starting percentiles **Bolded** values = reliability after floating percentile calculations

Notes:

False Negatives = incorrectly predicted no-hits/total hits
False Positives = incorrectly predicted hits/total no-hits
Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-STATcon.xls

% False Negatives	% False Positives	% Sensitivity	% 2002 Efficiency	% 1988 Efficiency	% Reliability
5	**74**	**95**	**26**	**66**	**68**
5	79	95	21	65	66
10	**56**	**90**	**44**	**71**	**72**
9	70	91	30	66	67
15	**48**	**85**	**52**	**73**	**72**
14	59	86	41	69	68
20	**35**	**80**	**65**	**77**	**74**
20	48	80	52	71	69
25	**30**	**75**	**70**	**79**	**73**
24	39	76	61	75	70
30	**19**	**70**	**81**	**85**	**75**
30	26	70	74	80	72

Unbolded values = initial reliability of starting percentiles **Bolded** values = reliability after floating percentile calculations

Notes:

False Negatives = incorrectly predicted no-hits/total hits
False Positives = incorrectly predicted hits/total no-hits
Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-STATref.xls

% False Negatives	% False Positives	% Sensitivity	% 2002 Efficiency	% 1988 Efficiency	% Reliability
5	**87**	**95**	**13**	**55**	**56**
5	94	95	6	53	53
10	**83**	**90**	**17**	**54**	**55**
10	89	90	11	53	52
14	**82**	**86**	**18**	**54**	**54**
14	86	86	14	52	51
20	**68**	**80**	**32**	**56**	**57**
20	82	80	18	52	50
25	**54**	**75**	**46**	**60**	**61**
25	66	75	34	56	56
30	**39**	**70**	**61**	**66**	**66**
29	53	71	47	60	60

Unbolded values = initial reliability of starting percentiles **Bolded** values = reliability after floating percentile calculations

Notes:

False Negatives = incorrectly predicted no-hits/total hits
False Positives = incorrectly predicted hits/total no-hits
Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations

FWReliability-STATrefcon.xls

% False Negatives	% False Positives	% Sensitivity	% 2002 Efficiency	% 1988 Efficiency	% Reliability
5	**87**	**95**	**13**	**60**	**61**
5	91	95	9	59	59
10	**82**	**90**	**18**	**61**	**60**
10	86	90	14	59	58
15	**73**	**85**	**27**	**62**	**61**
14	81	86	19	60	58
20	**74**	**80**	**26**	**60**	**58**
20	79	80	21	59	55
25	**66**	**75**	**34**	**61**	**58**
22	75	78	25	59	55
30	**59**	**70**	**41**	**62**	**58**
30	69	70	31	59	54

Unbolded values = initial reliability of starting percentiles **Bolded** values = reliability after floating percentile calculations

Notes:

False Negatives = incorrectly predicted no-hits/total hits
False Positives = incorrectly predicted hits/total no-hits
Sensitivity = correctly predicted hits/total hits = 100% - false negatives
2002 Efficiency = correctly predicted no-hits/total no-hits = 100% - false positives
1988 Efficiency = correctly predicted hits/total predicted hits
Reliability = correct predictions/total stations