FINDINGS OF COMPLIANCE

PROPOSED WIND RIVER FEDERAL NAVIGATION PROJECT

April 1981

1. Synopsis. Sediment samples were collected from the proposed Wind River navigation channel. Four samples were collected from the dredging area and two samples were collected from the proposed fill site. Samples were analyzed to determine their physical characteristics and to assess potential impacts due to proposed dredging and disposal activities.

BACKGROUND

2. Wind River is located 9 miles upstream of Bonneville Dam at Columbia River Mile (CRM) 154.5 (figure 1). The mouth of Wind River is broad and forms a protective inlet which is used for log rafting. During 1972, about 63,000,000 board feet of logs left the inlet and were moved to sawmills located downstream.

3. The pool behind Bonneville Dam is regulated on a daily basis ranging between 71.5 and 76.5 feet in elevation. When the pool elevation drops below 73 feet, shoals are exposed between the log rafting area and the Columbia River. This hinders log rafting operations and makes it more difficult to move the rafts into the open water of the Columbia River.

4. Currently, there is no Federal navigation project at Wind River. The Port of Skamania County has requested that an access channel be dredged from the Columbia River to a point 1,850 feet upstream from the mouth of Wind River. The proposed channel would be 10 feet deep and 100 feet wide. This would require the removal of approximately 36,000 cubic yards of sediment. It is further proposed that this dredged material be placed behind a dike and used for fill to extend the eastern bank of Wind River and widen the northern shoulder of highway SR 14 such that the two areas would extend into the log

rafting area. This area could then be developed into a public boat launching facility and parking lot.

5. Section 404 of the Clean Water Act, EPA guidelines (40 CFR 230)[1], and Portland District, Corps of Engineers' guidelines specify that sediment from the dredging and disposal sites must be evaluated prior to dredging to determine if significant physical, chemical, or biological impacts will result from disposal operations. If sediment consists of fine-grained material (i.e., 20 percent by weight of particles smaller than 0.074 mm in diameter) and contains more than 6 percent organic material or volatile solids, chemical data is obtained to determine if harmful levels of contaminants are present.[2]

6. Areas of particular concern in regards to disposal operation impacts are parks, national and historical monuments, national seashores, wilderness areas, research sites, municipal and private water supplies, fisheries, sanctuaries, refuges, wetlands, mudflats, recreational areas, vegetated shallows and threatened or endangered species. Also of concern are a disposal project's impacts on esthetics and the secondary and cumulative impacts of disposal operations.

METHODS

7. Sediment samples were collected in the proposed navigation channel on 28 April 1981 at four locations: 300, 700, and 1,300 feet north of the highway (SR 14) bridge and 1,000 feet south of the highway bridge in the Columbia River (figure 1). Two additional samples were collected in the proposed fill area, approximately 500 and 900 feet east of the channel (see table 1 for field notes). Samples were collected by pulling a 4-inch-by-15-inch cylinder which is closed at one end (Ellard Sampler), over the sediment surface. The samples were transferred to 1 quart plastic jars, labeled, and sealed. Physical analyses were performed by the Corps' Division Materials Laboratory, Troutdale, Oregon.

RESULTS

8. The results of physical analyses are presented in table 2 and figures 2 and 3. Void ratios ranged between 0.72 and 1.23 indicating that sediments were only moderately porous. Percent volatile solids is a measure of combustible organic material. The channel sediments contained less than 4 percent of these organics. The density of the sediments ranged between 2,702 and 2,727 g/l which are median values. The roundness grade estimates the angularity of material and, generally, angular material resists displacement more than rounded material and is probably closer to its point of origin. Sediments collected in the southern part of the proposed channel and in the Columbia River were subangular to subround. Sediments in the northern part of the channel (i.e., upstream) were subround to round. This is the opposite of what is normally expected.

9. The grain size distribution curves showed that channel sediment consisted predominantly of uniformly graded sand with less than 4 percent silt/clay. Sediments collected in the Columbia River and northern part of the channel were finer-grained than sediments from the southern part of the proposed channel. Again, this is the opposite of what is normally expected. Since the river narrows as it passes under the highway bridge, it is possible that the water velocity increases enough to transport fine-grained material downstream into the Columbia, leaving only coarse material behind.

10. Sediments in the proposed fill area are very different from channel area sediments. Material in the fill area is loosely packed with high void ratios and roundness grades. Additionally, this sediment contains 8-10 percent organic material and 60-90 percent silt/clay. The high organic content probably results from wood debris from log storage. The high silt/clay content indicates that the area acts as a settling basin for fine-grained sediments.

11. The watershed of Wind River is in the ash fallout area of Mt. St. Helens and it is likely that ash was washed downstream. The void ratios and roundness grades were high in the proposed fill area, as would be expected if ash were present. However, the presence of ash has not been confirmed by microscopic examination.

DISCUSSION

12. Physical analyses of samples from the proposed navigation channel indicate that sediments are predominantly sand with very little organic material. The channel and upstream watershed of Wind River is forested land and is removed from sources of pollution, other than those contributed by log handling. Log handling may add wood debris and wood leachates to sediments and the water column, respectively. However, the low organic content of channel sediments and the high current velocity (as indicated by the presence of gravel and coarse sand) suggest that adverse affects due to log handling are not significant. Therefore, as discussed in paragraph 230.60 (a-b) of the guidelines,[1] the dredged material is not likely to be a carrier of contaminants and no further chemical or biological testing is required.

13. There are several impacts that will result from using the dredged material as fill. Constructing a dike and subsequently filling the area behind it would result in the loss of aquatic habitat. The area of the fill has not been calculated, but is likely to be between 1 and 3 acres. Part of the disposal site consists of vegetated shallows. A beach seine was recently used to sample the fish population and many juvenile coho and chinook (159) were caught (Larry Rasmussen, U.S. Fish and Wildlife Service, personal communication), suggesting that these salmon use the disposal area for foraging. Additionally, diking and disposal operations will smother existing benthic organism and aquatic plants. However, the expected loss of habitat is small in relation to the total size of the log handling area.

14. Secondary impacts can also result from the proposed disposal activities. If boat launching facilities are constructed, increased boat traffic could add oil and grease to the sediment from engine and propeller lubricants. The severity of this impact would be dependent upon how heavily the facility is used.

15. Although the proposed diking and fill operation is small in comparison to the size of the log rafting area, development at the mouth of Wind River could lead to other projects which, cumulatively, could significantly affect the aquatic environment. For example, the north shoulder of highway SR 14 is

included as part of the fill area because of expected plans to widen the road. This will reduce the area of the aquatic habitat in addition to that lost from fill for the parking lot. The aquatic habitat adjacent to the highway contains rooted vascular plants and is therefore classified as a vegetated shallows.

16. If the dredging operation is initiated, the tug and barge company which puts together the log rafts would like to extend dredging to deepen the log rafting area to facilitate its operation. Since sediments in the log rafting area are predominantly silt/clay with high levels of organic material, dredging and disposal of this material could cause additional impacts to aquatic habitats at both the mouth of Wind River and at a disposal site. Such sediments would require chemical-biological testing.[1]

17. Alternatives to the proposed disposal operation would result in fewer adverse impacts. The sediment in the channel is clean. Upland disposal of clean sand would cause few environmental problems other than the temporary loss of the vegetation at the upland site. Inwater disposal of clean sand at nonvegetated sites would result in a minimal, short-term increase in turbidity. Physical impacts would be insignificant if the inwater site had been used in the past and/or the sediments at the inwater site were predominantly sand.

CONCLUSION

18. Samples from the proposed Wind River navigation project indicate that sediments are predominantly sand with very little organic content. The use of this material for fill would not adversely affect water quality. However, several physical impacts would result. Primary among these would be the loss of aquatic habitat (1 to 3 acres) including some vegetated shallows. This would reduce the foraging area of fish which now use the site (this includes salmon) and smother any existing benthic organisms. Further development of the area is proposed if dredged material is discharged in the bank areas. Such development would result in further secondary and cumulative impacts to the area.

RECOMMENDATIONS

19. A Finding of Compliance with the requirements of the "Guidelines for Specification of Disposal Sites for Dredged or Fill Material"[1] is recommended for disposal operations of dredged material from the proposed Wind River navigation project under the conditions discussed below.

20. EPA guidelines state that no discharge of dredged or fill material shall be permitted if there is a practicable alternative which would have less adverse impact on the aquatic ecosystem (40 CFR 230.10(a)).[1] Therefore, it is recommended that Wind River dredged material be discharged at an inwater disposal site in the Columbia River or placed upland. The dredged material is predominantly sand and has little potential to contain toxic substances or cause excessive turbidity upon disposal. Upland or inwater disposal at appropriate sites would not result in the permanent loss of aquatic habitat as would the proposed diking and fill operation. Currently, there are no proposed inwater or upland sites for this project.

21. If inwater or upland disposal is selected, the proposed disposal sites must undergo a Factual Determination and Finding of Compliance to assess potential impacts caused by the dumping operation.

22. The use of dredged material to extend the northern shoulder of highway SR 14 into the log rafting area does not comply with Federal regulations. The fill would cover a vegetated shallow area which guidelines define as a special aquatic site (40 CFR 230.43). All practicable alternatives which do not involve discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise (40 CFR 230.10(a)(3)).

23. Using dredged sediment from the proposed navigation channel for fill along the eastern edge of the log rafting area to create parking space and/or boat launching facilities, also does not comply with Federal guidelines. The proposed fill materail would cover aquatic habitat used by fish for foraging. It could lead to secondary development which might further impact the aquatic habitat. Additionally, Excutive Order 11990 (Federal Register, 25 May 77) directs Federal agencies to avoide undertaking or providing assistance for

new construction located in wetlands unless there are no practicable alternatives and the proposed project includes all practicable measures to minimize adverse impacts.

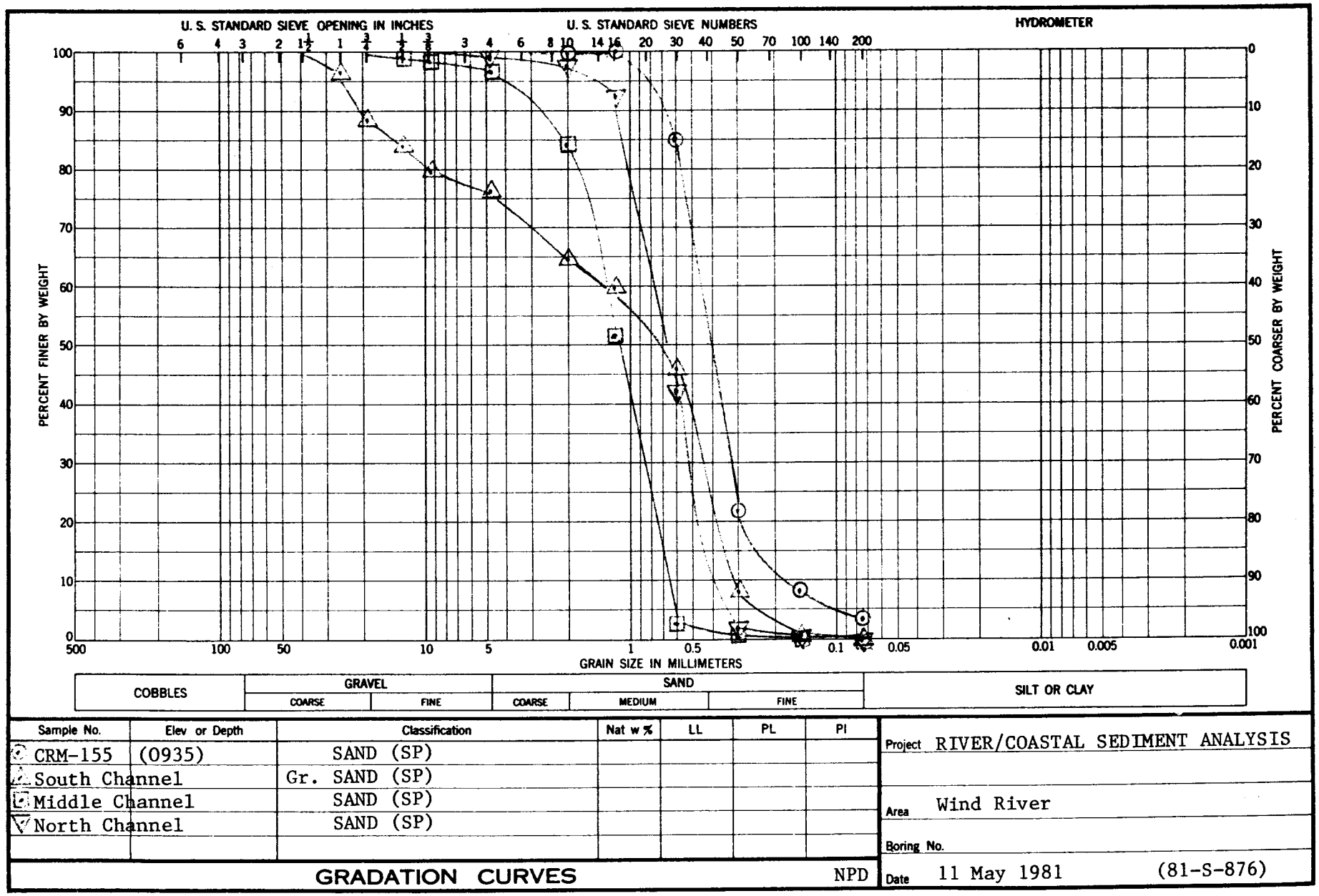
24. Sediments in the proposed Wind River channel are clean sand. This material would be excellent for use in mitigative projects such as those required as a result of the Bonneville second powerhouse.

25. Dredged sediments from Wind River deposited as fill would have no significant physical or chemical impact on national and historical monuments, national seashores, wilderness areas, research sites, municipal and private water supplies, parks, sanctuaries, refuges, mudflats esthetics, and threatened or endangered species. The project would have a beneficial effect by creating access for water-related recreation. It would also have a detrimental effect on wetlands, vegetated shallows and possibly recreational and commercial fisheries by destroying aquatic habitat.

Approximate location of the proposed fill

Sampling Site

Figure 1. Aerial photograph of Wind River showing the proposed channel and fill area.



Sample No.	Elev or Depth	Classification	Nat w %	LL	PL	PI
CRM-155	(0935)	SAND (SP)				
South Channel		Gr. SAND (SP)				
Middle Channel		SAND (SP)				
North Channel		SAND (SP)				

GRADATION CURVES NPD

Project RIVER/COASTAL SEDIMENT ANALYSIS

Area Wind River

Boring No.

Date 11 May 1981 (81-S-876)

Figure 2. Grain size distribution curves of sediment samples collected from Wind River, WA.

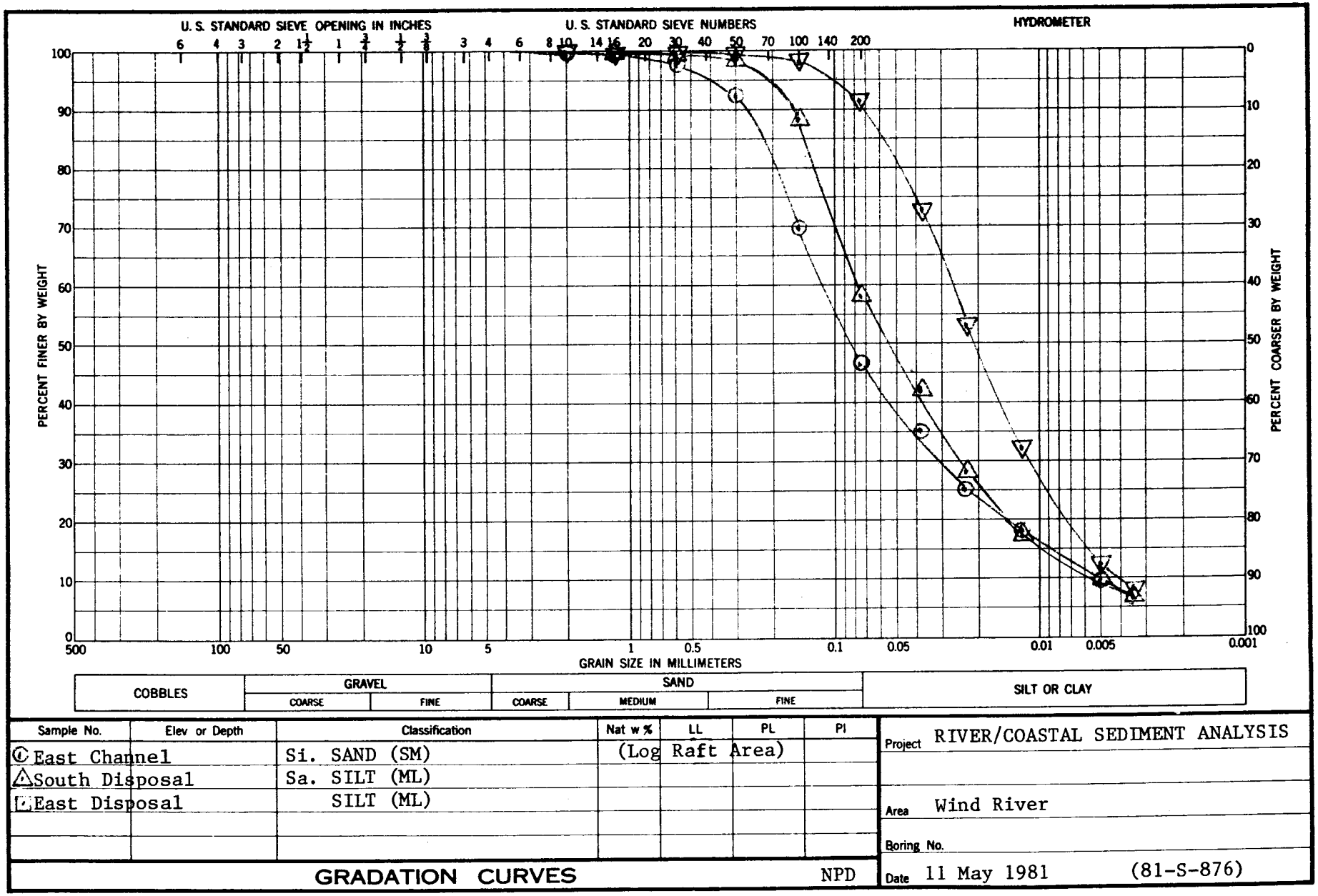


Figure 3. Grain size distribution curves of sediment samples collected from Wind River, WA.

FIELD REPORT

Table 1. Wind River, Washington

Purpose of Sampling Pre-dredging analysis of sediments collected from the proposed navigation channel.

Date 28 April 1981 Wind 5-10 MPH

Water Conditions (Wave heights & Direction, Tides, Currents) Overcast with intermwritten showers. Water clear and shallow

Weather _____ Sampling Vessel 16 ft. Aluminum Hull

Sampling Personnel Jerry Berins (boat operator), Mike Kidby, Stu U'Ren Sampling Gear _____

Analytical Laboratory Division Materials Lab. Sandy Tababayashi

Comments (Wildlife, Sampling Difficulties, etc.) Disposal Site Sourrounded by road fill, sedges at water's edge, young alder trees and grass.

Station	Depth	Sampling Time	Sampling Methodology	Sampling Description
1,000 ft. S. of Hwy. 14	8 ft	0935	Sml. Ellard	Proposed Channel on Columbia River Side of Wind River area. Coarse sand with mud. Turbidity = 1.1 NTU
300 ft. N. Hwy. 14	6	0940	" "	North of Hwy. bridge. Can see bottom, very coarse sand with a thin layer of mud.
700 ft. N. of Hwy. 14	6	0945	" "	N. of Hwy. bridge between old bridge piers. Very coarse sand. Turbidity = 1.7 NTU
1,300 ft. N. of Hwy. 14	1	0950	Pushed Jar into Sediment from gunwale	Very Coarse sand (100 ft. above old bridge piers).
500 ft. N. and 150 ft. E. of Hwy. 14	8	1000	Sml. Ellard	In log rafting staging area approx. 150 ft. East of proposed channel. Sand/Silt/Clay/Organic Material.

Conclusions (Is sampling completed? Was sampling method adequate? Considerations for future sampling at the project)

FIELD REPORT

Wind River (Con't)

Purpose of Sampling

Date 28 April 1981 Wind

Water Conditions (Wave heights & Direction, Tides, Currents)

Weather Sampling Vessel

Sampling Personnel Sampling Gear

Analytical Laboratory

Comments (Wildlife, Sampling Difficulties, etc.)

Station	Depth	Sampling Time	Sampling Methodology	Sampling Description
500 ft. E.	2 ft	1005	Sml Ellard	Proposed disposal site at base of Hwy. bed
of channel			Turbidity = 0.8. NTU	at southeast edge of project. Stirred up
				sediments and turbidity during sampling. Mat of
				Freshwater aquatic plants and (slight odor of
				hydrogen sulfide) silt/clay, small amount of
				organic material.
900 ft. E.	12 ft	1010	Sml. Ellard	Not an extensive mat of plants. Sample mostly
of channel				silt/clay. Turbidity = 4.2 NTU

Conclusions (Is sampling completed? Was sampling method adequate? Considerations for future sampling at the project)

Table 2.

RIVER/COASTAL SEDIMENT ANALYSIS

Wind River

Sample Identification	Specific Gravity of Water	Density of Matl. in place gms/liter	Density of Median Solids gms/liter	Void Ratio	% Volatile Solids	Roundness Grade
CRM-155 (1,000 ft. S. of Hwy. 14	1.0004	1764	2702	1.229	3.83	Subangular to Subround
South Channel (300 ft. N. of Hwy. 14)	1.0001	2007	2727	0.716	3.55	Subangular to Subround
Middle Channel (700 ft. N. of Hwy. 14)	1.0001	1891	2725	0.936	3.68	Subround to Round
North Channel (1,300 ft. N. of Hwy. 14)	1.0004	1834	2723	1.067	3.82	Subround to Round
East Channel (Log Raft Area) (500 ft. N. and 150 ft. E. of Hwy. 14)	1.0002	1383	2643	3.286	10.30	Angular
South Disposal (500 Ft. E. of channel)	*1.000	1445	2652	2.711	8.27	Angular
East Disposal (900 ft. E. of channel)	1.0004	1352	2565	3.453	10.87	Angular

*Distilled water used to saturate sample.

REFERENCES

1. U.S. Environmental Protection Agency. 1980. Guidelines for Specification of Disposal Sites for Dredged or Fill Material. Federal Register 45 (249): 85336-85357.

2. U.S. Army Corps of Engineers. 1980. Supplemental, Interim Procedures for Evaluating and Testing Discharges of Dredged Material. U.S. Army Corps of Engineers, Portland District, Portland, Oregon.