STATE OF CALIFORNIA – THE RESOURCES AGENCY GRAY DAVIS, *Governor*

CALIFORNIA COASTAL COMMISSION
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STAFF REPORT AND RECOMMENDATION

ON CONSISTENCY DETERMINATION

Consistency Determination No.	**CD-65-99**
Staff:	MPD-SF
File Date:	6/14/99
45th Day:	7/29/99
60th Day:	8/13/99
Commission Meeting:	7/13/99

FEDERAL AGENCY: **CORPS OF ENGINEERS**

DEVELOPMENT LOCATION: Anaheim Bay, Seal Beach, Orange County, and EPA-approved offshore disposal site LA-2, six miles southwest of Point Fermin, San Pedro (Exhibits 1-5)

DEVELOPMENT DESCRIPTION: Maintenance dredging of 236,650 cu. meters of material, with nearshore disposal of up to 133,000 cu. meters of clean sandy sediment at Surfside Beach (Exhibit 3), and disposal of 103,650 of material at LA-2 (Exhibit 2)

SUBSTANTIVE FILE DOCUMENTS:

1. Consistency and Negative Determinations for Corps of Engineers maintenance dredging of Anaheim Bay/Seal Beach channels and Surfside-Sunset Beach Replenishment projects: CD-11-82, CD-36-83, CD-12-84, CD-21-88, CD-27-89, CD-40-89, CD-2-90, CD-34-90, CD-52-90, ND-58-95, CD-28-97, and CD-67-97.

2. Evaluation of Dredged Material Proposed for Ocean Disposal, Testing Manual, Environmental Protection Agency (EPA) and the Corps of Engineers, February, 1991.

3. EPA Consistency Determinations for LA-2 Site Designation and Extension (CD-63-90 and CD-114-96).

EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers has submitted a consistency determination for maintenance dredging of the navigation channels in Anaheim Bay, Seal Beach. The Corps proposes to dredge 236,650 cubic meters (cu. m.) of material from the existing channels. Disposal will consist of beach disposal of 133,000 cu. m. of clean sandy material at nearby Surfside Beach, just outside and east of the east harbor breakwater, and ocean disposal of 103,650 cu. m. of clean fine (non-sandy) material at the EPA-designated offshore dredge disposal site LA-2.

The project: (1) constitutes an allowable use for dredging and filling under Section 30233 of the Coastal Act, as it is necessary to maintain previously dredged depths in existing navigational channels; (2) is the least damaging alternative; (3) will protect sandy beaches because suitable material dredged from the channels will be placed at nearby Surfside Beach; (4) will protect the marine environment as the material has been tested and is uncontaminated; and (5) and will protect least terns, snowy plovers and grunions and minimize access impacts because the dredging will occur outside the sensitive time period for these species and outside the peak summer recreation season. The Corps proposes to begin dredging after September 20, 1999, and complete dredging before March 2000. Therefore the project is consistent with the marine resources, dredging, water quality, sand supply, habitat, and public access and recreation policies (Sections 30230, 30231, 30233, 30210-30212, 30220 and 30240) of the Coastal Act.

STAFF SUMMARY AND RECOMMENDATION:

I. Project Description. The U.S. Army Corps of Engineers (Corps) proposes the maintenance dredging of the existing navigation channels in Anaheim Bay, Seal Beach, including a total dredging amount of 236,650 cu. meters (cu. m.) of material, in order to maintain a 39 ft. depth in the inner and outer harbor and approach channels (Exhibits 4-5). The material is uncontaminated and, depending on predominant grain size, disposal would either consist of beach disposal (133,000 cu. m. of clean sandy material) at nearby Surfside Beach, just outside and east of the east harbor breakwater (Exhibits 1 & 3), or ocean disposal (103,650 cu. m.) of fine (non-sandy) material at the EPA-approved offshore dredge disposal site LA-2 (Exhibit 2). Dredging is scheduled to occur between September 20, 1999, and February 2, 2000. A hopper or hydraulic cutterhead dredge would be used to perform the dredging. For

the beach disposal part of the operation the material would be pumped over the east jetty, with material spread across the beach with bulldozers and a front loading tractor. Ocean disposal would occur using barges.

II. Previous Commission History. The Commission has previously reviewed a number of Corps consistency and negative determinations at Seal Beach for both maintenance dredging projects with beach replenishment, and purely beach nourishment projects. The previous submittal most similar to the subject project was concurred with as a negative determination (CD-21-88), which not raise significant resource or habitat concerns. In three consistency determinations in 1982-1984 (CD-11-82, CD-36-83, CD-12-84), concerns were raised because disposal included wetland fill (CD-11-82) or placement of heavy equipment in wetlands and sensitive areas (CD-36-83); these concerns were resolved through subsequent project modifications. In CD-12-84, concerns were raised about dredging during grunion season and peak beach recreation season; the grunion issues were resolved through project modifications and the impacts to recreation were considered offset by the significant long-term recreational benefits from beach nourishment. Five years later, in CD-27-89, resource (and access) concerns were minimized through project timing commitments. That beach replenishment project was extended several times and reviewed under the negative determination process (CD-40-89, CD-2-90, CD-34-90, and CD-52-90).

Several subsequent reviews raised timing concerns and habitat impacts. After two Commission concurrences with Sept.-March Corps beach replenishment projects (CD-27-89 and ND-58-95), the Corps submitted a consistency determination for an extension of time for dredging beyond March 1 (CD-28-97). This time extension raised new resource issues and the need for additional mitigation measures, which the Corps agreed to incorporated into the operation to minimize habitat impacts, including using a single point discharge above mean higher high water and further measures to minimize turbidity.

In CD-67-97, the Corps proposed extension of the project termination date to July 31, 1997, as well as other modifications. The Commission concurred, after the Corps agreed to use settling ponds and filter fabrics to minimize turbidity, and to monitor project effects on the tern and grunion.

III. Federal Agency's Consistency Determination. The Corps of Engineers has determined the project to be consistent to the maximum extent practicable with the California Coastal Management Program.

IV. Staff Recommendation:

The staff recommends that the Commission adopt the following motion:

MOTION. I move that the Commission **concur** with the Corps of Engineers' consistency determination.

The staff recommends a **YES** vote on this motion. A majority vote in the affirmative will result in adoption of the following resolution:

Concurrence

The Commission hereby **concurs** with the consistency determination made by the Corps of Engineers for the proposed project, finding that the project is consistent to the maximum extent practicable with the California Coastal Management Program.

V. Findings and Declarations:

The Commission finds and declares as follows:

A. Dredging/Filling/Water Quality/Marine Resources. Section 30230 of the Coastal Act states that:

> *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Section 30231 of the Coastal Act states that:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Section 30233 of the Coastal Act provides the following in relevant part:

> *(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:*
>
> ...

> *(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.*
>
> ...
>
> *(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.*
>
> ...

The proposed maintenance dredging and disposal project needs to be examined for consistency with Section 30233 of the Coastal Act. Under Section 30233, dredging and filling of open coastal waters, including disposal of dredge materials, is limited to those cases where the proposed project is an allowable use, is the least damaging alternative, and where mitigation measures have been provided to minimize environmental impacts. The allowable use test is met because the dredging and disposal operation is being performed to maintain existing navigation channels at their previously dredged depths, rendering the project an allowable use under Section 30233(a)(2). The alternatives test is met because the proposed disposal locations, beach disposal for sandy material and open ocean disposal at an EPA-approved and Commission-authorized ocean disposal site for uncontaminated but non-beach compatible material have historically and consistently been considered to represent the least damaging feasible alternatives for disposal of dredged materials.

Concerning the mitigation test, the Commission has not traditionally required mitigation measures for the temporary impacts of dredging of clean materials, and, as discussed in the environmentally sensitive habitat section below, mitigation (in the form of project timing) measures have been incorporated into the project where necessary to protect coastal resources (including least terns, snowy plovers, and grunions). Therefore, the Commission finds that the proposed project is consistent with the allowable use, alternatives, and mitigation tests contained in (Section 30233(a)) of the Coastal Act.

Concerning potential water quality and other marine resource impacts, as required for all dredging projects involving beach and/or ocean disposal, the quality of the sediments proposed for dredging and disposal have been evaluated by the applicant pursuant to the procedures described in the 1991 EPA/Corps testing manual, Evaluation of Dredged Material Proposed for Ocean Disposal -- Testing Manual (i.e., the "Green Book"). The testing procedures described in the Green Book allow for a tiered approach to analysis of the dredged sediments. It is necessary to proceed through the tiers only until information sufficient to determine compliance or noncompliance with EPA's regulations has been obtained. Only if there is not enough information to determine suitability or unsuitability for ocean disposal after the completion of a tier, will the applicant be required to complete the next tier testing.

In order to dispose of dredge sediments at LA-2, the Corps evaluated its material according to the current Green Book procedures. Under these procedures, bulk chemistry analyses were sufficient to enable a determination that the materials are uncontaminated. As a result of this evaluation the Corps states the materials are suitable for ocean disposal (See Exhibit 6 for test results). EPA agrees that the sediments are be suitable for ocean disposal, stating:

> *Subsequent to the completion of the physical and chemical testing of the proposed dredged materials, the Corps and Navy proposed disposal of the fine-grained materials at the LA-2 ocean disposal site. Given the very low levels of contamination for these materials, consistent with previous testing of dredged materials from the Anaheim Bay channels,[1] and comparison to bulk sediment chemistry data for the LA-2 reference site, EPA concurred on the disposal of these materials at LA-2.*

In conclusion, the Commission staff and EPA have reviewed the Corps' test results, which establish that the dredged sediments proposed for disposal at LA-2 are uncontaminated and suitable for ocean disposal. Therefore, the Commission finds that the beach and ocean disposal of this material will not affect the biological productivity of marine resources and water quality, and that the project is consistent with Sections 30230 and 30231 of the Coastal Act.

B. Environmentally Sensitive Habitat. Section 30240 of the Coastal Act provides that:

> *(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.*
>
> *(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.*

The proposed project may affect three federally listed species: the California brown pelican, California least tern, and western snowy plover. Several species of marine mammals and sea turtles may be transient visitors to the harbor and the LA-2 disposal site, but the project will not affect these species. In its environmental assessment, the Corps describes the habitat needs of the federally listed species as follows:

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[1]The Corps conducted full Greenbook testing of Anaheim Bay dredged materials in 1987. Based on the results of the bulk sediment chemistry and biological testing, these materials were approved by the Corps, with EPA concurrence, for disposal at Surfside-Sunset (for physically compatible materials) and at the LA-2 ocean disposal site for the remaining dredged materials.

Of the threatened and endangered species, only the brown pelican, least tern, and snowy plover will potentially occur within the dredging area. The noise and activity will likely disturb the pelicans which rest on the nearby breakwater and jetties. However, there are several other loafing areas available in the local area for the pelicans to use.

Pelicans will find other areas in the harbors ... to forage. Therefore, operations will not significantly impact foraging, roosting, and/or loafing areas in the local area for pelicans. The project will have "no effect" on brown pelicans.

Least terns may also forage in the project area (a least tern breeding area is located adjacent to the outer harbor); however, the project will begin and be completed outside of the least tern nesting season (April 15th to September 1). Due to project environmental commitments that will avoid the least tern nesting area altogether and because the associated "no construction" window will be observed, no significant impacts to least terns or to their critical habitat areas are expected to occur from the proposed dredging.

Because the snowy plover nesting season occurs within the same time frame as that of the least tern, this species would likewise not experience any significant adverse impacts from the proposed dredging.

Brown pelicans are generally not affected by daytime dredging operations. Least terns and snowy plovers can be adversely affected by increases in turbidity from dredging. However the project will minimize effects on least terns and snowy plovers and grunions because the dredging, which is scheduled to take place between September 20, 1999, and February 2, 2000, will occur outside the sensitive time period for these species. For the same reason, because the project falls outside grunion spawning season, effects on grunions would also be avoided. Therefore, given the project timing and the fact that the material has been tested and is uncontaminated, the Commission finds that the proposed project is consistent with the environmentally sensitive habitat protection policy (Section 30240) of the Coastal Act.

C. Sand Supply. Section 30233(b) of the Coastal Act provides that:

Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable long shore current systems.

The Corps of Engineers proposes to dispose approximately 133,000 cubic meters of clean dredged material at Surfside Beach. Grain size analysis indicates that this portion of the proposed dredge material is suitable for beach replenishment, and that the remaining material (proposed for open ocean disposal at LA-2) is not suitable for beach replenishment based on grain size. The Commission finds that the project would result in suitable materials being used for beach replenishment and is therefore consistent with the sand supply policy (Section 30233(b)) of the Coastal Act.

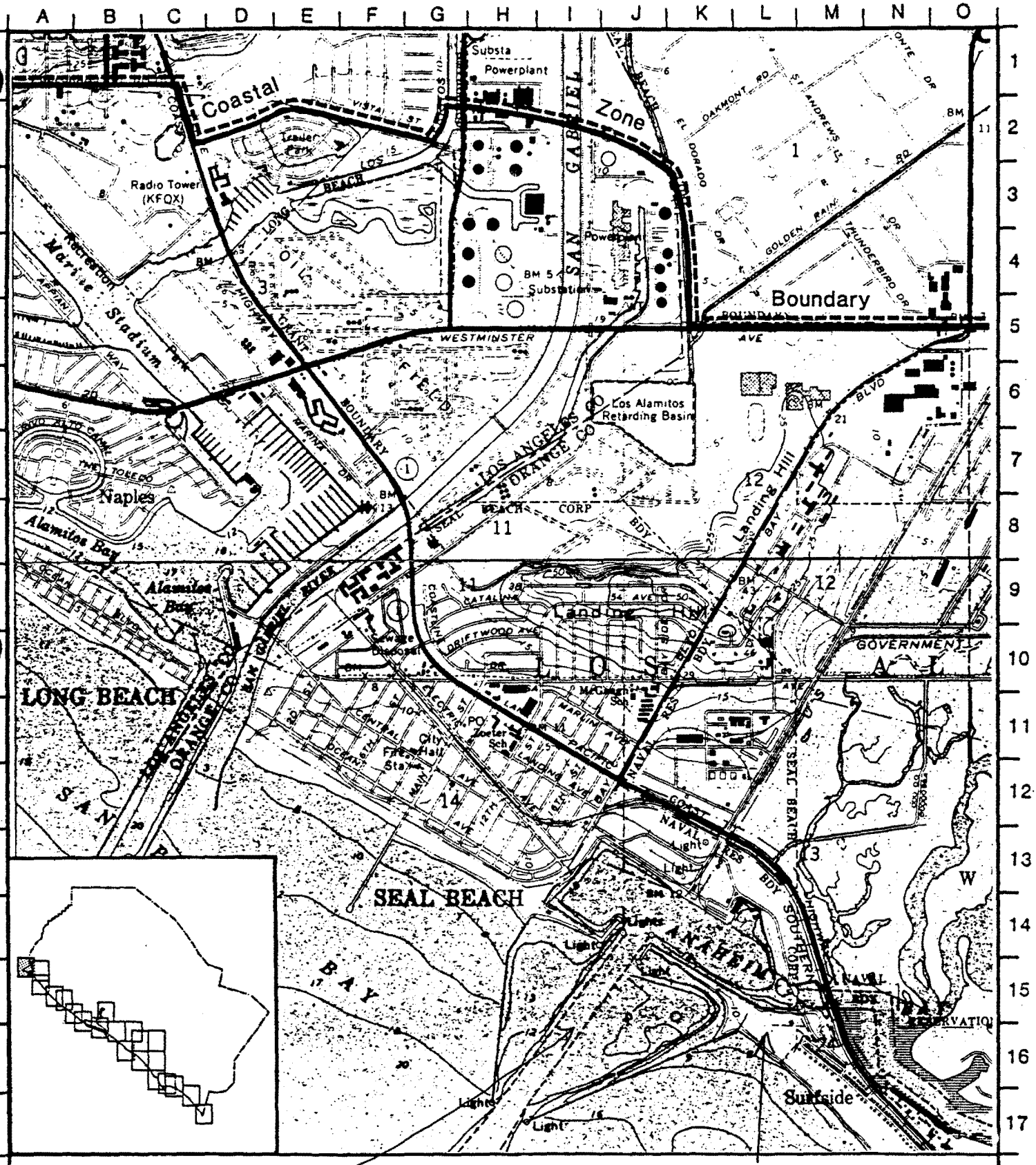
D. Public Access and Recreation. Section 30210 of the Coastal Act provides, in part, that:

> *In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.*

Section 30220 of the Coastal Act provides that:

> *Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.*

The Corps proposes to place approximately 133,000 cubic meters of sediment dredged from Anaheim Bay on nearby Surfside Beach. The project's public access and recreation impacts would be minimal, as the project has been scheduled to avoid the peak summer recreation season, and the dredge pipe placement has been designed to avoid any effects on surfing outside the east breakwater. In addition, the Commission generally supports this type of beneficial reuse of dredged material because it improves sand supply, resulting in wider beaches and improved coastal recreation. The Commission therefore finds the project consistent with the public access and recreation policies (Sections 30210-30220) of the Coastal Act.



California Coastal Commission

EXHIBIT NO.	1
APPLICATION NO.	
CD-65-99	

County of Orange

Sheet 1 of 21

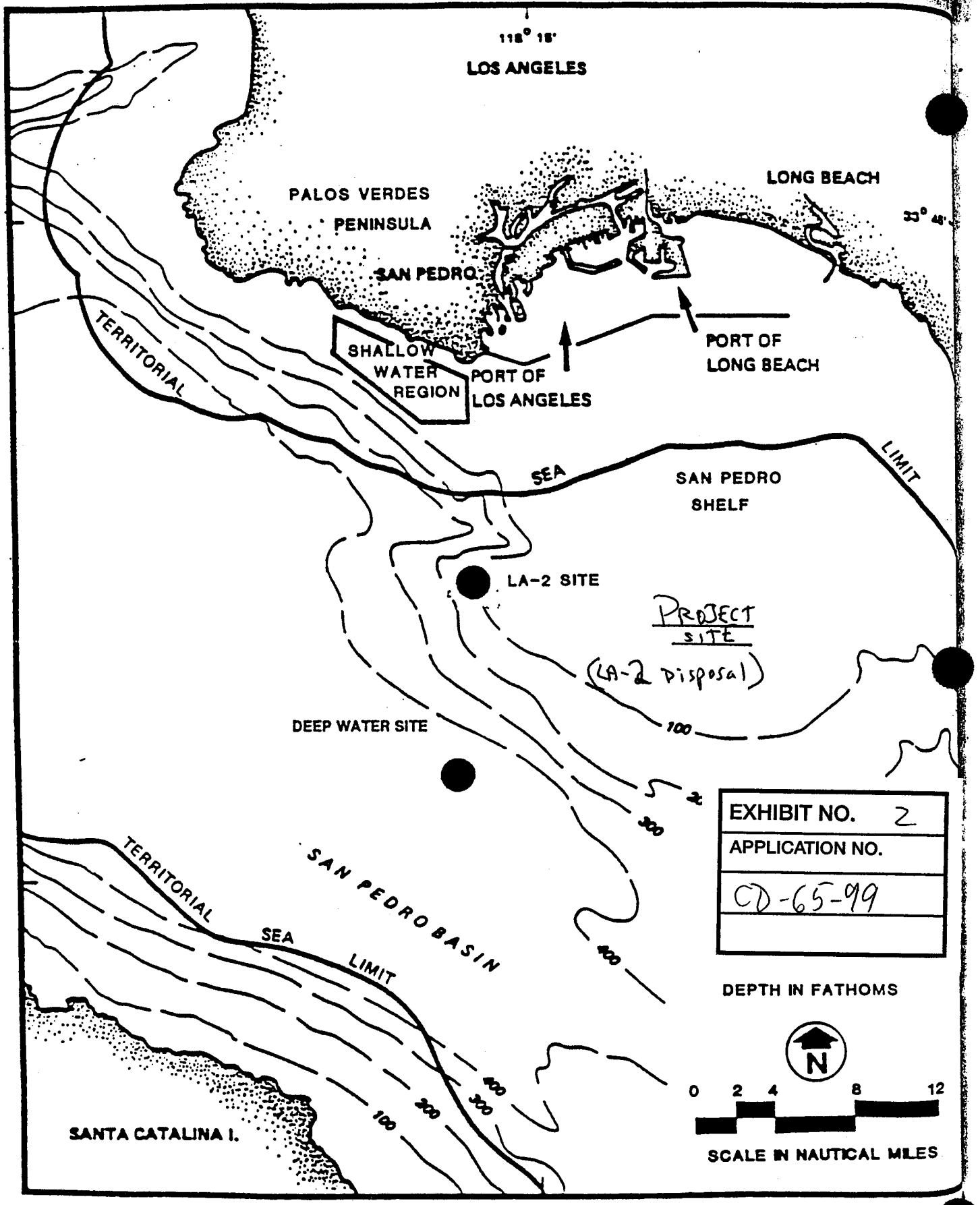


FIGURE 4. LOCATION OF ALTERNATIVE OCEAN DISPOSAL SITES IN THE SAN PEDRO SHELF AND BASIN

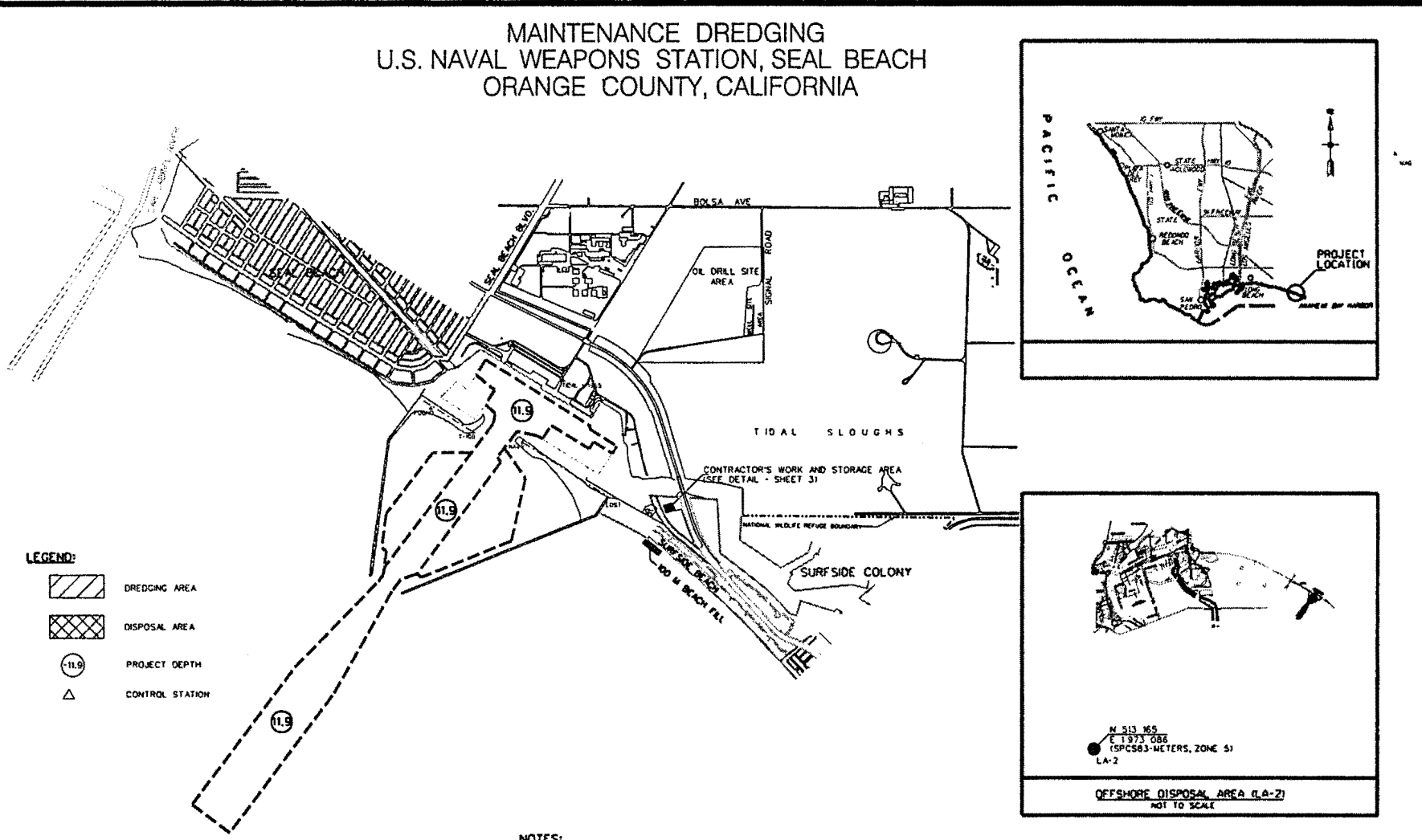


Figure 1. Project area

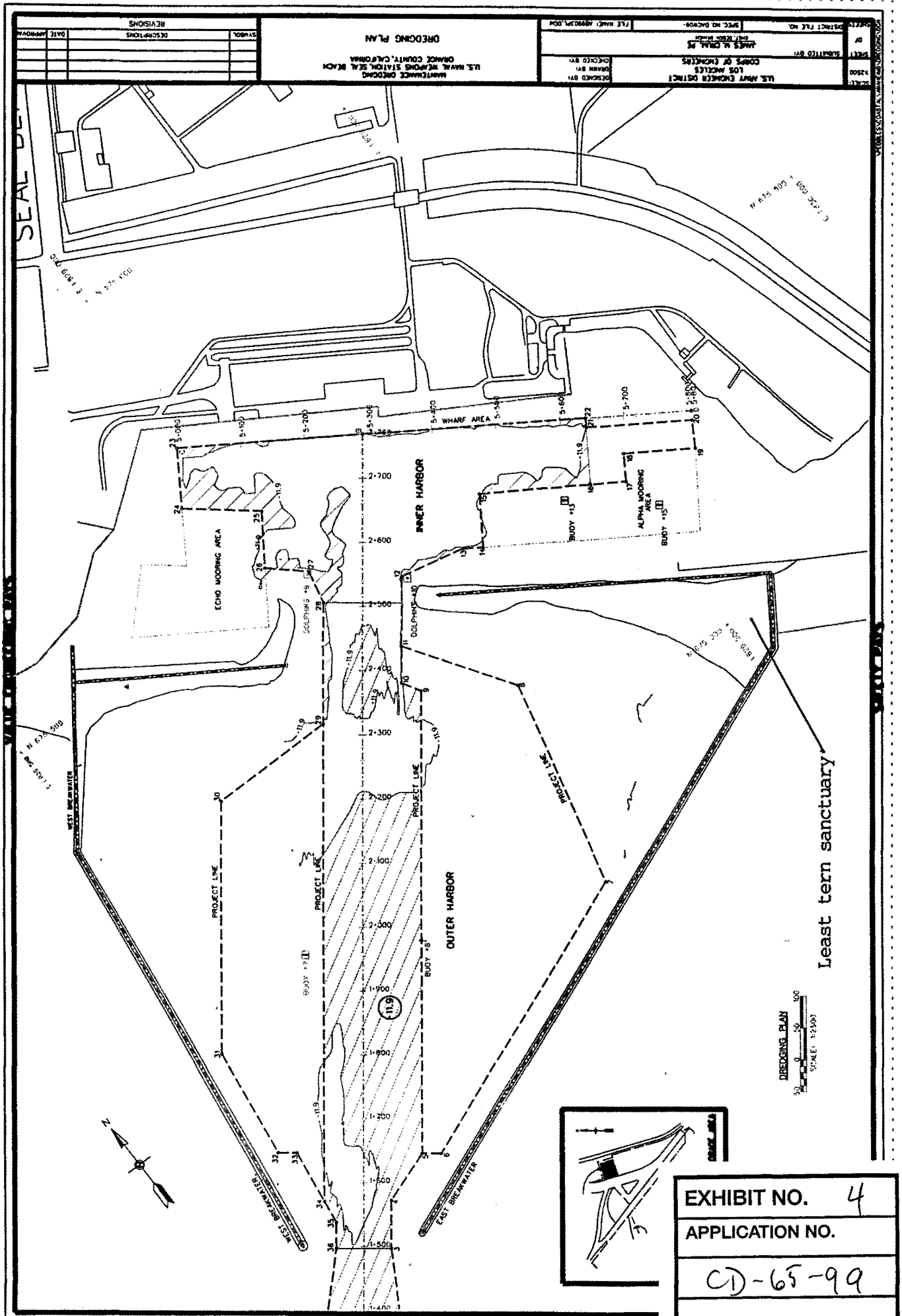


EXHIBIT NO. 4

APPLICATION NO.

CD-65-99

Figure Inner and outer harbors

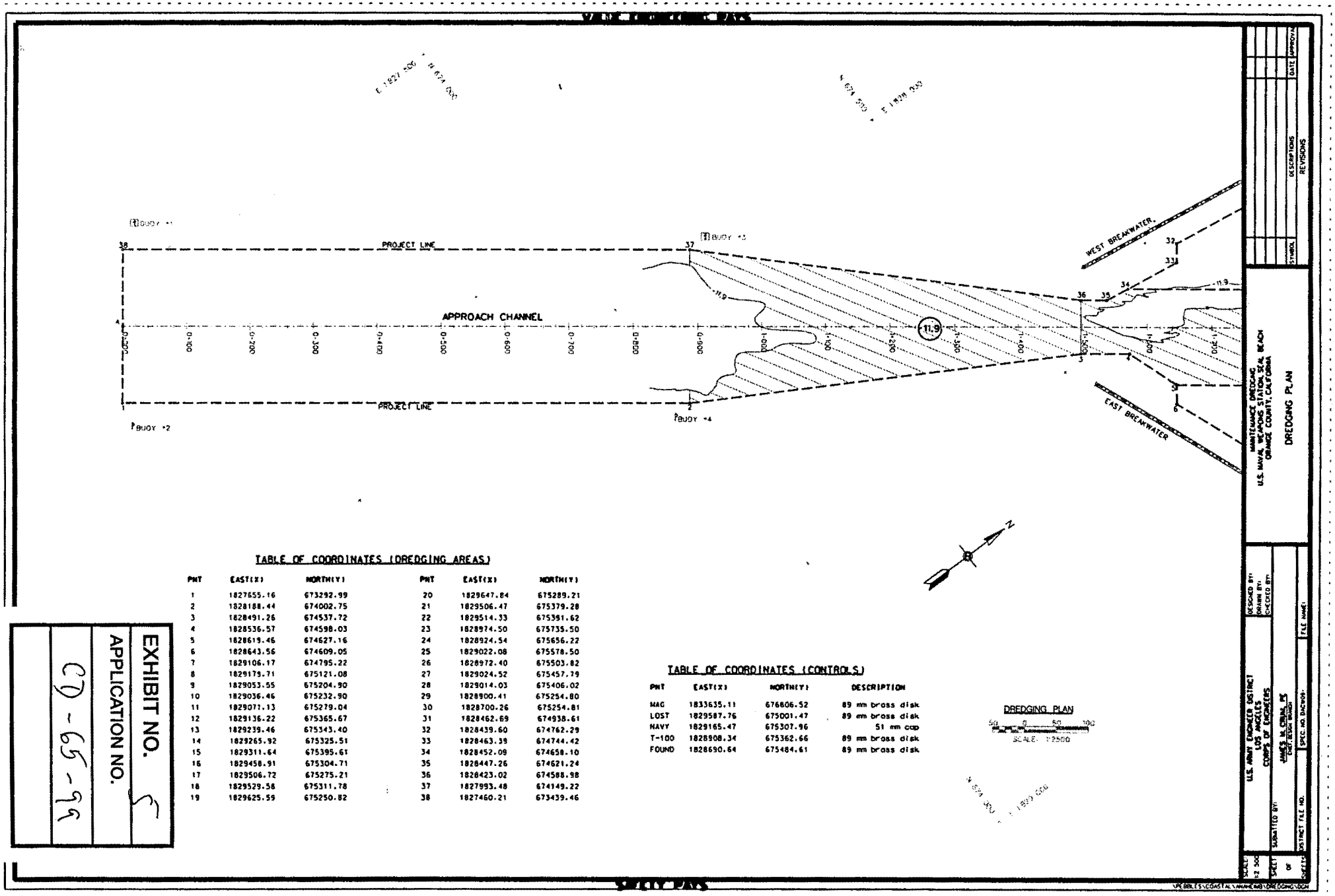


TABLE OF COORDINATES (DREDGING AREAS)

PNT	EAST(X)	NORTH(Y)	PNT	EAST(X)	NORTH(Y)
1	1827655.16	673292.99	20	1829647.84	675289.21
2	1828188.44	674002.75	21	1829506.47	675379.28
3	1828491.26	674537.72	22	1829514.33	675391.62
4	1828536.57	674598.03	23	1828974.50	675735.50
5	1828619.46	674627.16	24	1828924.54	675656.22
6	1828643.56	674609.05	25	1829022.08	675578.50
7	1829106.17	674795.22	26	1828972.40	675503.82
8	1829179.71	675121.08	27	1829024.52	675457.79
9	1829053.55	675204.90	28	1829014.03	675406.02
10	1829036.46	675232.90	29	1828900.41	675254.80
11	1829071.13	675279.04	30	1828700.26	675254.81
12	1829136.22	675365.67	31	1828462.69	674938.61
13	1829239.46	675343.40	32	1828439.60	674762.29
14	1829265.92	675325.51	33	1828463.39	674744.42
15	1829311.64	675395.61	34	1828452.08	674658.10
16	1829458.91	675304.71	35	1828447.26	674621.24
17	1829506.72	675275.21	36	1828423.02	674588.98
18	1829529.58	675311.78	37	1827993.48	674149.22
19	1829625.59	675250.82	38	1827460.21	673439.46

TABLE OF COORDINATES (CONTROLS)

PNT	EAST(X)	NORTH(Y)	DESCRIPTION
MAG	1833635.11	676606.52	89 mm brass disk
LOST	1829587.76	675001.47	89 mm brass disk
NAVY	1829165.47	675307.96	51 mm cap
T-100	1828908.34	675362.66	89 mm brass disk
FOUND	1828690.64	675484.61	89 mm brass disk

EXHIBIT NO. 5

APPLICATION NO. 5-99-99

Figure 3. Approach channel

APPENDIX A

Sediment Grain Size and Chemistry Results

PROJECT : ANAHEIM BAY

10.0 <-- Number of samples

LAB NO.	HOLE NO.	METERS DEPTH TOP	METERS DEPTH BOT	BEACH SAND GRADATIONS —SAND (sieve no.)— 3/4	3/8	4	7	10	14	18	25	35	45	60	80	120	170	Fines 200	230	ATTERBERG LIMITS LL	PI	FIELD DATA M.C.	DENS	12:00 AM CLASSIFICATION
	Seive size (mm)			19	19.5	4.75	2.8	2	1.4	1	0.71	0.5	0.36	0.25	0.18	0.13	0.09	0.075						

PROJECT : ANAHEIM BAY

10.0 <-- Number of samples

LAB NO.	HOLE NO.	METERS DEPTH TOP	METERS DEPTH BOT	BEACH SAND GRADATIONS —SAND (sieve no.)— 3/4	3/8	4	7	10	14	18	25	35	45	60	80	120	170	Fines 200	230	ATTERBERG LIMITS LL	PI	FIELD DATA M.C.	DENS	12:00 AM CLASSIFICATION
356	DCAB-99- 2	0.0	5.2	100	100	100	100	99	97	95	89	75	52	34	27	23	15	10	8		N/P			SP-SM Poorly Graded Sand With Silt
357	DCAB-99- 3	0.0	5.0	100	100	100	100	99	97	94	87	73	54	40	30	26	19	12	11		N/P			SP-SM Poorly Graded Sand With Silt
358	DCAB-99- 4	0.0	5.2	100	100	100	100	100	100	99	98	96	93	85	76	67	34	21	17					SM Silty Sand
359	DCAB-99- 5	0.0	4.1	100	100	100	100	100	100	99	99	97	93	87	80	71	44	26	19					SM Silty Sand
360	DCAB-99- 6	0	6.5	100	100	100	99	99	98	97	96	93	89	83	78	71	31	18	14		N/P			SM Silty Sand
361	DCAB-99- 7	0.0	1.3	100	100	97	97	97	96	95	95	94	93	93	91	85	52	36	31					SM Silty Sand
362	DCAB-99- 7	1.3	4.5	100	100	100	100	100	99	99	98	98	97	97	95	91	69	58	54					ML Sandy Silt
363	DCAB-99- 8	0.0	8.0	100	100	100	98	97	95	93	90	83	71	60	53	44	20	11	8		N/P			SP-SM Poorly Graded Sand With Silt
364	DCAB-99- 9	0.0	4.0	100	100	99	98	97	96	96	95	94	93	92	90	83	42	27	24					SM Silty Sand
365	DCAB-99- 9	4.0	8.0	100	100	99	97	96	95	94	93	90	85	82	78	67	21	9	5		N/P			SP-SM Poorly Graded Sand With Silt
366	DCAB-99- 10	0.0	3.2	100	100	100	100	100	99	98	98	97	95	93	89	74	32	20	17					SM Silty Sand
367	DCAB-99- 10	3.2	5.2	100	100	100	100	100	100	99	98	97	96	95	93	87	58	45	41					SM Silty Sand
368	DCAB-99- 12	0.0	3.0	100	100	100	100	100	99	98	97	96	95	93	89	65	20	10	7					SP-SM Poorly Graded Sand With Silt
369	DCAB-99- 12	3.0	8.0	100	100	100	100	100	98	96	93	91	89	87	83	69	27	17	14					SM Silty Sand
370	DCAB-99- 12	0.0	4.2	100	100	100	100	100	99	98	94	85	69	41	23	13	5	3	2					SP Poorly Graded Sand
371	DCAB-99- 13	4.2	5.2	100	100	100	100	99	98	97	93	86	78	70	64	54	24	14	12					SM Silty Sand
372	DCAB-99- 16	0.0	2.4	100	100	100	99	99	97	96	94	92	91	89	85	71	36	26	24					SM Silty Sand
373	DCAB-99- 16	2.4	5.0	100	100	100	100	100	99	99	98	97	96	95	93	84	48	35	32					SM Silty Sand
374	DCAB-99- 18	0.0	3.8	100	100	100	100	100	100	100	99	99	99	99	98	96	83	75	74					ML Silt With Sand
375	DCAB-99- 21	0.0	4.5	100	100	100	100	99	97	96	95	94	93	92	90	86	75	67	62					ML Sandy Silt
376	DCAB-99- 23	0.0	4.5	100	100	100	100	100	99	98	97	96	96	95	93	90	82	77	74					ML Silt With Sand
377	DCAB-99- 24	0.0	4.2	100	100	100	100	100	100	99	99	99	98	97	95	90	74	66	62					ML Sandy Silt
378	DCAB-99- 26	0.0	3.7	100	100	100	100	100	99	99	98	98	97	96	94	86	64	55	52					ML Sandy Silt
379	DCAB-99- 27	0.0	4.0	100	100	100	100	100	99	99	98	97	96	94	93	91	85	80	78					ML Silt With Sand
380	DCAB-99- 28	0.0	4.8	100	100	100	100	100	100	99	99	99	98	97	96	93	85	79	77					ML Silt With Sand
381	DCAB-99- 29	0.0	4.0	100	100	100	100	100	100	99	99	98	98	97	95	90	77	71	68					ML Silt With Sand
382	DCAB-99- 30	0.0	5.0	100	100	100	100	100	100	100	99	99	99	99	98	95	86	80	77					ML Silt With Sand
383	DCAB-99- 31	0.0	2.0	100	100	100	98	96	93	91	86	79	73	68	63	58	51	47	44					SM Silty Sand
384	DCAB-99- 31	2.0	3.5	99	98	97	95	93	90	85	73	55	41	30	23	18	14	12	12					SP-SM Poorly Graded Sand With Silt
385	DCAB-99- 32	0.0	6.0	100	99	98	97	96	93	87	75	54	33	16	8	4	3	3	2					SP Poorly Graded Sand
386	DCAB-99- 33	0.0	2.5	100	100	100	100	100	100	100	100	99	99	96	88	80	70	62	56					ML Sandy Silt
387	DCAB-99- 33	2.5	5.0	100	100	100	100	100	100	99	99	99	97	89	68	42	23	15	11					SM Silty Sand
388	DCAB-99- 34	0.0	3.0	100	100	100	100	99	98	96	91	80	62	41	30	23	18	15	14					SM Silty Sand
389	DCAB-99- 34	3.0	5.3	100	100	100	99	99	98	96	90	78	61	40	26	18	13	12	12					SP-SM Poorly Graded Sand With Silt
390	DCAB-99- 35	0.0	1.8	100	100	100	100	99	97	95	93	92	90	88	85	80	64	56	52					ML Sandy Silt
391	DCAB-99- 35	1.8	4.0	100	100	100	98	95	90	84	75	65	57	49	42	35	27	24	23					SM Silty Sand
392	DCAB-99- 36	0.0	3.6	100	100	95	95	94	93	93	92	91	89	87	82	65	22	11	8					SP-SM Poorly Graded Sand With Silt
393	DCAB-99- 39	0.0	4.0	100	100	100	100	100	100	100	99	99	98	97	95	89	73	66	62					ML Sandy Silt
394	Profile 1	12.0		100	100	100	99	98	94	90	83	72	60	45	30	18	9	6	5					SP-SM Poorly Graded Sand With Silt
395	Profile 1	6.0		100	100	100	100	100	100	100	96	78	43	15	6	2	1	1	1					SP Poorly Graded Sand
396	Profile 1	MLLW		100	100	100	99	97	94	91	86	77	58	23	5	2	2	2	2					SP Poorly Graded Sand
397	Profile 1	-6.0		100	100	100	100	100	100	99	98	96	93	87	71	42	11	4	2					SP Poorly Graded Sand
398	Profile 1	-12.0		100	100	100	100	100	100	100	100	99	99	98	97	89	32	14	8					SM Silty Sand
399	[redacted] 1	-18.0		100	100	100	100	100	100	100	99	98	95	[redacted]	90	84	32	13	6					SM Silty Sa[redacted]

PROJECT : ANAHEIM BAY

10.0 <-- Number of samples

LAB NO.	HOLE NO.	METERS DEPTH TOP	METERS DEPTH BOT	BEACH SAND GRADATIONS —SAND (sieve no.)— 3/4	3/8	4	7	10	14	18	25	35	45	60	80	120	170	Fines 200	230	ATTERBERG LIMITS LL	PI	FIELD DATA M.C.	DENS	12:00 AM CLASSIFICATION	
400	Profile 1	-24.0		100	100	100	100	100	100	100	100	98	96	94	91	88	49	25	15					SM	Silty Sand
401	Profile 1	-30.0		100	100	100	100	100	100	100	99	96	89	76	68	63	41	17	8					SM	Silty Sand
402	Profile 2	12.0		100	100	100	100	100	99	98	90	65	32	11	4	1	1	1	1					SP	Poorly Graded Sand
403	Profile 2	6.0		100	100	100	99	97	92	85	72	49	25	9	4	2	1	1	1					SP	Poorly Graded Sand
404	Profile 2	MLLW		100	100	100	99	99	96	92	86	82	77	68	32	10	3	7	8					SP	Poorly Graded Sand
405	Profile 2	-6.0		100	100	100	99	97	93	87	75	58	39	20	8	4	2	2	2					SP	Poorly Graded Sand
406	Profile 2	-12.0		100	100	100	100	100	100	100	100	99	98	94	83	56	17	7	3					SP-SM	Poorly Graded Sand With Silt
407	Profile 2	-18.0		100	100	100	100	100	100	100	100	100	99	98	97	93	32	12	5					SP-SM	Poorly Graded Sand With Silt
408	Profile 2	-24.0		100	100	100	100	100	100	100	100	98	96	94	93	90	67	39	26					SM	Silty Sand

BULK CHEMICAL RESULTS for ANAHEIM BAY
March 1999

Test	Analytical Method	Analytical Method Reporting Limit	Units	Sediment Quality Guidelines (SQGs) ERL (Long et al., 1995)	ERM Long et al., 1995	SL (PSSDA, 1988)	ML (PSSDA, 1988)	CHEM #1 Diver Cores 31-35	CHEM #2 Diver Cores 26-30,39	CHEM #3 Diver Cores 18,18,21,23,24,26	CHEM #4 Diver Cores 1-10,12,13	CHEM #5 Beach Profiles
								Anaheim Bay				Receiving Beach
								WHARF AREA	MOORING AREAS	MAIN CHANNEL	CHANNEL ENTRANCE	BEACH PROFILES
PHYSICAL or CONVENTIONAL												
Total Solids (wet weight)	EPA 160.3	0.1 (Detection Limit)	%					75.1	60.6	57	73	77.6
Total Volatile Solids (wet weight)	EPA 160.4	0.1 (Detection Limit)	%					0.8	1.5	1.70	0.6	0.4
pH (wet weight)	EPA 9045B	0.01 (Detection Limit)	pH units					8.42	8.42	8.14	8.28	7.9
Ammonia (dry weight)	EPA 350.2M	0.1	mg/kg					3.9	21.8	17.2	5.3	0.8
Total Organic Carbon (dry weight)	EPA 9060	0.019	%					0.069	0.269	0.304	0.079	0.019
Total Sulfides (dry weight)	EPA 9030M	0.3	mg/kg					24	46.2	91.2	38.4	0.3
Oil and Grease (dry weight)	EPA 413.1M	3	mg/kg					6.6	6.3	4.7	5.3	3
METALS and NONMETALS												
Arsenic (As)	EPA 6020	0.1 (wet weight)	mg/kg	8.2	70	70	700	2	5.4	5.4	2.5	2.1
Cadmium (Cd)	EPA 6020	0.1 (wet weight)	mg/kg	1.2	9.6	0.96	9.6	0.23	0.46	0.44	ND	ND
Chromium (Cr)	EPA 6020	0.1 (wet weight)	mg/kg	81	370			11.3	28.5	29.1	9.8	7.5
Copper (Cu)	EPA 6020	0.1 (wet weight)	mg/kg	34	270	81	810	10	29.5	25.8	6	3.2
Lead (Pb)	EPA 6020	0.1 (wet weight)	mg/kg	46.7	218	66	660	12.6	46.2	31.1	6.2	2.6
Mercury (Hg)	EPA 7471	0.02 (wet weight)	mg/kg	0.15	0.71	0.21	2.1	0.11	0.10	0.12	0.04	ND
Nickel (Ni)	EPA 6020	0.1 (wet weight)	mg/kg	20.9	51.6	28	120	7.1	17.5	18.2	7.2	5.0
Selenium (Se)	EPA 6020	0.1 (wet weight)	mg/kg					ND	ND	2.6	2.6	2.1
Silver (Ag)	EPA 6020	0.1 (wet weight)	mg/kg	1	3.7	1.2	5.2	ND	0.21	0.25	ND	ND
Zinc (Zn)	EPA 6020	0.1 (wet weight)	mg/kg	150	410	160	1600	36.2	83.5	84.6	25.9	17.8
PESTICIDES												
Total Chlorinated Pesticides	EPA 8081A	0.026	mg/kg					ND	ND	ND	ND	ND
Aldrin	EPA 8081A	0.003	mg/kg			0.005		ND	ND	ND	ND	ND
Chlordane and Derivatives	EPA 8081A	0.003	mg/kg			0.005		ND	ND	ND	ND	ND
Dieldrin	EPA 8081A	0.003	mg/kg			0.005		ND	ND	ND	ND	ND
DDT and Derivatives	EPA 8081A	0.003	mg/kg	0.00158	0.0461	0.0089	0.089	ND	ND	ND	ND	ND
Endosulfan and Derivatives	EPA 8081A	0.003	mg/kg					ND	ND	ND	ND	ND
Endrin and Derivatives	EPA 8081A	0.003	mg/kg					ND	ND	ND	ND	ND
Heptachlor and Derivatives	EPA 8081A	0.003	mg/kg			0.005		ND	ND	ND	ND	ND
Heptachlorocyclohexane and Derivatives	EPA 8081A	0.003	mg/kg			0.005		ND	ND	ND	ND	ND
Methoxychlor	EPA 8081A	0.003	mg/kg					ND	ND	ND	ND	ND
Toxaphene	EPA 8081A	0.026	mg/kg					ND	ND	ND	ND	ND
ORGANIC COMPOUNDS												
ORGANOTINS												
Total Organotins	GC/FPD	0.0013	mg/kg					0.0149	ND	ND	0.0071	ND
Monobutyltin	GC/FPD	0.0013	mg/kg					ND	ND	ND	ND	ND
Dibutyltin	GC/FPD	0.0013	mg/kg					ND	ND	ND	ND	ND
Tributyltin	GC/FPD	0.0013	mg/kg					ND	ND	ND	ND	ND
Tetrabutyltin	GC/FPD	0.0013	mg/kg					0.0149	ND	ND	0.0071	ND
PETROLEUM HYDROCARBONS												
Total Recoverable Petroleum Hydrocarbons	EPA 418.1	1	mg/kg					3.7	4.1	1.8	2.6	1.5
PHTHALATES												
Total phthalates	EPA 8270C	0.013	mg/kg					ND	0.031	0.033	ND	ND
Dimethyl phthalate	EPA 8270C	0.013	mg/kg			0.16		ND	ND	ND	ND	ND (0.010)
Diethyl phthalate	EPA 8270C	0.013	mg/kg			0.097		ND	ND	ND	ND	ND (0.010)
Di-n-butyl phthalate	EPA 8270C	0.013	mg/kg			1.4		ND	ND	ND	ND	ND
Butyl benzyl phthalate	EPA 8270C	0.013	mg/kg			0.47		ND	0.031	0.033	ND	ND
Bis (2-ethylhexyl) phthalate	EPA 8270C	0.013	mg/kg			3.1		ND	ND	ND	ND	ND
Di-n-octyl phthalate	EPA 8270C	0.013	mg/kg			69		ND	ND	ND	ND	ND
POLYCHLORINATED BIPHENYLS (PCB)												
Total PCB Congeners	EPA8082		ug/kg	50	400	2500	130	10.2	25.7	13.5	1.7	0.1
Aroclor 1254	EPA 8082	0.500	ug/kg									
Aroclor 1260	EPA 8082	0.500	ug/kg									
POLYNUCLEAR AROMATICS HYDROCARBONS (PAH)												
Total PAHs	EPA 8270C	0.026	mg/kg	4.022	44.792			1.448	0.043	0.000	0.000	0.000
Subtotal - Low molecular weight PAH			mg/kg	0.552	31.6	0.61	6.1	0.101	0.000	0.000	0.000	0.000
Acenaphthene	EPA 8270C	0.026	mg/kg	0.016	0.5	0.063	0.63	ND	ND	ND	ND	ND
Naphthalene	EPA 8270C	0.026	mg/kg	0.16	2.1	0.21	2.1	ND	ND	ND	ND	ND
Acenaphthylene	EPA 8270C	0.026	mg/kg	0.044	0.64	0.064	0.64	ND	ND	ND	ND	ND
Anthracene	EPA 8270C	0.026	mg/kg	0.0853	1.1	0.13	1.3	0.057	ND	ND	ND	ND
Phenanthrene	EPA 8270C	0.026	mg/kg	0.24	1.5	0.32	3.2	0.044	ND	ND	ND	ND
Fluorene	EPA 8270C	0.026	mg/kg	0.019	0.54	0.064	0.64	ND	ND	ND	ND	ND
Subtotal - High molecular weight PAH			mg/kg	1.7	9.6	1.8	51	1.347	0.043	0.000	0.000	0.000
Fluoranthene	EPA 8270C	0.026	mg/kg	0.6	5.1	0.63	6.3	0.068	ND	ND	ND	ND
Benzo(a)anthracene	EPA 8270C	0.026	mg/kg	0.261	1.6	0.45	4.5	0.130	ND	ND	ND	ND
Benzo(e)pyrene	EPA 8270C	0.026	mg/kg	0.43	1.8	0.66	6.6	0.124	ND	ND	ND	ND
Benzo(b)fluoranthene	EPA 8270C	0.026	mg/kg			0.6 (b)	6 (b)	0.109	ND	ND	ND	ND
Benzo(k)fluoranthene	EPA 8270C	0.026	mg/kg					0.148	ND	ND	ND	ND
Chrysene	EPA 8270C	0.026	mg/kg	0.384	2.8	0.67	6.7	0.200	ND	ND	ND	ND
Benzo(g,h,i)perylene	EPA 8270C	0.026	mg/kg			0.54	5.4	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	EPA 8270C	0.026	mg/kg	0.0634	0.26	0.12	1.2	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	EPA 8270C	0.026	mg/kg			0.599	5.25	0.029	ND	ND	ND	ND
Pyrene	EPA 8270C	0.026	mg/kg	0.665	2.6	0.85	7.3	0.521	0.043	ND	ND	ND
PHENOLS												
Total Phenols	EPA 8270C	0.128	mg/kg					ND	ND	ND	ND	ND
Phenol	EPA 8270C	0.026	mg/kg					ND	ND	ND	ND	ND
2-Chlorophenol	EPA 8270C	0.026	mg/kg					ND	ND	ND	ND	ND
2-Nitrophenol	EPA 8270C	0.026	mg/kg					ND	ND	ND	ND	ND
2,4-Dimethylphenol	EPA 8270C	0.026	mg/kg					ND	ND	ND	ND	ND
2,4-Dichlorophenol	EPA 8270C	0.026	mg/kg					ND	ND	ND	ND	ND
4-Chloro-3-Methylphenol	EPA 8270C	0.026	mg/kg					ND	ND	ND	ND	ND
2,4-Dinitrophenol	EPA 8270C	0.128	mg/kg					ND	ND	ND	ND	ND
4-Nitrophenol	EPA 8270C	0.026	mg/kg					ND	ND	ND	ND	ND
4,6-Dinitro-2-Methylphenol	EPA 8270C	0.128	mg/kg					ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	EPA 8270C	0.026	mg/kg					ND	ND	ND	ND	ND
Pentachlorophenol	EPA 8270C	0.128	mg/kg					ND	ND	ND	ND	ND

Notes:

MRL for parameter with matrix interference (dry weight, unless noted)
mg/kg = milligrams per kilogram (dry weight unless noted)
EPA = United States Environmental Protection Agency
ND = not detected at or above lowest MRL value for the particular compound(s) of interest
Total Chlorinated Pesticides = sum of named compounds and their derivatives
Total Phthalates = sum of six named compounds
Total PCB Congeners = sum of mono- through decachlorobiphenyl compounds
Total PAHs = sum of sixteen named compounds

Chlordane and Derivatives = sum of gamma-Chlordane, alpha-Chlordane, and Chlordane
DDT and Derivatives = sum of 4,4'-DDE; 4,4'-DDD; and 4,4'-DDT
Endosulfan and Derivatives = sum of Endosulfan I, Endosulfan II, and Endosulfan Sulfate
Endrin and Derivatives = sum of Endrin, Endrin Aldehyde, and Endrin Ketone
Heptachlor and Derivatives = sum of Heptachlor and Heptachlor Epoxide
Hexachlorocyclohexane and Derivatives = sum of alpha-BHC, beta-BHC, gamma-BHC (Lindane), and delta-BHC
(a) = Estimated
(b) = combined benzofluoranthenes
Total Phenols = sum of eleven named compounds

Screening Criteria Notes:
ERL = Effects Range-Low; ERM = Effects Range-Median (Long, et al., 1995)
SL = Screening Level; ML = Maximum Level (PSSDA, 1988)
Reporting Limits = lowest value obtained for dry weight sample
Shaded Box = Screening Level(s) exceeded
Chem #1-5 = Composite Sample
ug/kg = parts per billion (dry weight unless noted)