

CALIFORNIA COASTAL COMMISSION

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Hearing Date: March 11-14, 1997

STAFF REPORT: REGULAR CALENDAR

APPLICATION NO.: **5-96-163**

APPLICANT: **PORT OF LOS ANGELES**

PROJECT LOCATION: Main Channel from the S.P. Slip north to Berths 84 and 234, and the Pier 400 Stage 1 landfill, Port of Los Angeles, Los Angeles County (Exhibits 1 and 2).

PROJECT DESCRIPTION: Deepening a portion of the Main Channel to -50 feet Mean Lower Low Water, and upland disposal of approximately 400,000 cubic yards of clean dredged sediment at the Pier 400 Stage 1 landfill.

SUBSTANTIVE FILE DOCUMENTS:

1. Port of Los Angeles Port Master Plan (as amended through November 1996).
2. Addendum to the Final Environmental Impact Report for Pier 400 Deep Draft Navigation Improvements (Port of Los Angeles, 1996).
3. Chemical Analysis and Evaluation of Sediments, Stage 1 Pier 400 Main Channel Borrow Area, Directive VII, Port of Los Angeles; Kinnetic Laboratories Incorporated and ToxScan Incorporated, November 1996.
4. Geotechnical Evaluation of Dredge Unit CG-1, Channel Deepening Program, Port of Los Angeles; Fugro West, Inc., October 1996.

SUMMARY OF STAFF RECOMMENDATION

Staff is recommending approval of coastal development permit application 5-96-163 (Port of Los Angeles) with special conditions addressing protection of water quality and marine resources. The permit application calls for deepening a 3,800-foot-long section of the Main Channel in the Port of Los Angeles from its current depth of -45 feet Mean Lower Low Water (MLLW) to -50 feet MLLW, and upland disposal of the 400,000 cubic yards of clean dredged sediments at the Pier 400 Stage 1 landfill.

STAFF NOTE:

The proposed project is located within the jurisdictional boundary of the Port of Los Angeles. Therefore, the project will be evaluated for conformance with the Coastal Act by using the applicable Chapter 8 policies of the Act. In addition, the Port submitted a coastal development permit application to the Commission for the proposed channel deepening because this project is not listed in the port master plan. The Port is preparing a port master plan amendment for deepening the entire Main Channel, but needed to move forward on a segment of that larger project prior to completion of the plan amendment process in order to obtain needed fill material for the under-construction Pier 400 Stage 1 landfill. Both the permit application and the plan amendment are reviewed for conformance with the policies of Chapter 8 of the Coastal Act, and as such, processing this coastal development permit application does not reduce the level of review for the proposed project, nor does it commit the Commission to any decision on the upcoming port master plan amendment for deepening the entire Main Channel. Instead, the proposed development provides a timely mechanism for the Port to complete the Pier 400 Stage 1 landfill.

STAFF RECOMMENDATION.

The staff recommends that the Commission adopt the following resolution:

APPROVAL WITH CONDITIONS.

The Commission hereby grants, subject to the conditions below, a coastal development permit on the grounds that the development, as conditioned, is in conformance with the provisions of Chapter 8 of the Coastal Act, and will not have any significant adverse impacts on the environment within the meaning of the California Environmental Quality Act.

STANDARD CONDITIONS: See Attachment 1.

SPECIAL CONDITIONS:

1. All U.S. Army Corps of Engineers Section 404 permit conditions associated with the Port of Los Angeles' proposed Main Channel deepening project, including all monitoring and remediation requirements, are hereby incorporated into this coastal development permit.
2. All California Regional Water Quality Control Board Section 401 certification conditions associated with the Port of Los Angeles' proposed Main Channel deepening project, including all monitoring and remediation requirements, are hereby incorporated into this coastal development permit.
3. The Port of Los Angeles shall submit to the Executive Director all monitoring reports associated with the Main Channel deepening project, the Corps of Engineers Section 404 permit for the project, and the California Regional Water Quality Control Board Section 401 certification for the project.

FINDINGS AND DECLARATIONS.

The Commission hereby finds and declares as follows:

A. Project Description. The Port of Los Angeles proposes to deepen to -50 feet Mean Lower Low Water (MLLW) a 3,800-foot-long by 800-foot-wide section of the Main Channel extending from the S.P. Slip north to Berths 84 and 234. Within the project area, designated by the Port as dredge unit CG-1, approximately 400,000 cubic yards of sediment will be dredged and placed on the north-central portion of the under-construction Pier 400 Stage 1 landfill (Exhibits 1-3). This upland site currently extends to +7 feet MLLW but remains approximately eight feet below final design grade. The materials within dredge unit CG-1 are comprised of non-native harbor bottom sediments (very soft to soft silt and silt with sand), disturbed native deposits (sands and sands with silt), and undisturbed native deposits (sands and sands with silt). While these sediments in the project area were tested and determined suitable for unconfined ocean disposal, no in-water disposal of dredged sediments is proposed as a part of this project. The Main Channel was deepened in 1982 from -35 feet MLLW to -45 feet MLLW to accommodate deep-draft vessels, and maintenance dredging last occurred in 1995. Additional deepening of the Main Channel is now required so that fully-loaded deep-draft container ships can safely access berths along the Main Channel, and to provide coarse-grained sands to alleviate a shortfall of suitable geotechnical fill material at the Stage 1 landfill.

B. Marine Resources and Water Quality. Section 30705 of the Coastal Act provides in part:

(a) Water areas may be diked, filled, or dredged when consistent with a certified port master plan only for the following:

(1) Such construction, deepening, widening, lengthening, or maintenance of ship channel approaches, ship channels, turning basins, berthing areas, and facilities as are required for the safety and the accommodation of commerce and vessels to be served by port facilities.

(2) New or expanded facilities or waterfront land for port-related facilities.

...

(b) The design and location of new or expanded facilities shall, to the extent practicable, take advantage of existing water depths, water circulation, siltation patterns, and means available to reduce controllable sedimentation so as to diminish the need for future dredging.

(c) Dredging shall be planned, scheduled, and carried out to minimize disruption to fish and bird breeding and migrations, marine habitats, and water circulation. Bottom sediments or sediment elutriate shall be analyzed for toxicants prior to dredging or mining, and where water quality standards are met, dredge spoils may be deposited in open coastal water sites designated to minimize potential adverse impacts on marine organisms, or in confined coastal waters designated as fill sites by the master plan where such spoil can be isolated and contained, or in fill basins on upland sites. Dredge material shall not be transported from coastal waters into estuarine or fresh water areas for disposal.

(d) For water areas to be diked, filled, or dredged, the commission shall balance and consider socioeconomic and environmental factors.

Section 30708 provides in part:

All port-related developments shall be located, designed, and constructed so as to:

(a) Minimize substantial adverse environmental impacts. . . .

The primary issue associated with the proposed project is potential water quality impacts from dredging operations in the Main Channel. Because disposal of the dredged sediments will occur at an upland location, and not in Port or open ocean waters, water quality impacts from dredge disposal in the marine environment are not an issue. The 1996 Addendum to the Port's Pier 400 Deep Draft Navigation Improvements Final Environmental Impact Report (FEIR) examines potential impacts to water quality and

biological resources from proposed deepening of the Main Channel and states in part the following:

Water Quality. Significant impacts from the FEIR [for the Pier 400 project] were water quality impacts from turbidity, release of nutrients, and release of contaminants during dredging and fill operations. The materials to be dredged will be restricted to clean sands. Turbidity from dredging sands is highly localized and short-term in nature. Impacts from this source are considered to be insignificant. Clean sands are characterized by low levels of both nutrients and contaminants. The sands to be dredged will not contain substantial amounts of either. Therefore, dredging is not expected to result in significant releases of either nutrients or contaminants.

Placement of material will be above +15' MLLW; therefore, placement of this material will not result in any impacts to water quality. Runoff from the placement of dredged materials will have to meet the requirements of the Waste Discharge Requirement and the U.S. Army Corps of Engineers permit issued for the Deep Draft Navigation Improvements Project and will not result in significant impacts to water quality.

Biological Resources. Significant impacts from the FEIR [for the Pier 400 project] were short-term loss of benthic infauna and potential for toxic effects on species as a result of dredging and landfilling. Adverse impacts mitigated to insignificance were loss of deep-water habitat and foraging habitat for the brown pelican and loss of shallow water foraging habitat for the California least tern.

The changes would result in additional short-term loss of benthic infauna. However, due to the small area to be impacted, the impact will be short-term and is not considered to be a substantial increase in the severity of the previously identified significant impact. As discussed above, there is not expected to be a potential for toxic effects on species as a result of dredging or landfilling. The proposed changes will not result in the loss of either deep-water or shallow-water habitat. The proposed changes will, therefore, not result in any new, significant impacts.

Subsequent to preparation of the above-referenced Addendum to the FEIR, the Port calculated that the proposed dredged sediments would be placed on the Stage 1 landfill at or above an elevation of +7 feet MLLW, rather than at +15 feet MLLW. This change does not affect the conclusion in the Addendum that upland disposal of the dredged sediments will not result in significant impacts to water quality.

In addition to the FEIR Addendum referenced above, a detailed chemical analysis and evaluation of the proposed dredged sediments was prepared for the Port by Kinnetic Laboratories Incorporated and ToxScan Incorporated (November 1996). This report notes that for incorporation of dredged sediments into a landfill, only bulk sediment

chemistry analysis is required, rather than the more extensive Tier III testing under the EPA/Corps "Green Book" guidelines for in-water disposal. Sediment analysis for the proposed project must demonstrate that the sediments contain low concentrations of contaminants and that the elutriates from the sediments will not cause a discharge from the fill that will be in excess of water quality criteria. The following chemical and physical analyses were performed on individual sediment cores and on site composites collected from the project site (which was divided into Areas CG-1A and CG-1B):

- Sediment Grain Size
- Interstitial Water Salinity, pH, and Total Ammonia
- Total and Soluble Sulfides
- Oil and Grease, Total Petroleum Hydrocarbon
- Total Organic Carbon
- Metals
- Organotins
- Chlorinated Pesticides and PCBs
- Polynuclear Aromatic Hydrocarbons and Phthalates

The report states that project sediments are relatively coarse grained, and are comprised generally of fine to medium sand to sand with silt. Sand content in the composite samples ranged from 79 to 93 percent, silt ranged from 5 to 14 percent, and clay ranged from 2 to 7 percent. Given these results, the Port determined that the sediments are suitable from a geotechnical standpoint for placement in the Pier 400 Stage 1 landfill.

Bulk sediment chemistry analysis showed that:

The top composite at CG-1A showed low but detectable amounts of total (13 ppm) and soluble (0.2 ppm) sulfides, and CG-1B top showed only 1.3 ppm of total sulfide. Total organic carbon values were very low in CG-1A (top)(0.3%) and CG-1B (top). Neither oil and grease nor petroleum hydrocarbons were detected in any of the four components. Bottom composites showed no detectable sulfide and TOC values (<0.1%).

Results of metal analyses showed that most metal contaminants were detected in all four sediment composites. Top composites were generally higher in metal concentrations than were bottom composites. Arsenic ranged from 0.4 to 2.3 ppm, cadmium from 0.1-0.2 ppm, and chromium from 17-25 ppm. Copper was present at between 7.7 and 19 ppm, lead ranged from 3.9 to 8.2 ppm, mercury from 0.04 to 0.09 ppm, nickel from 10-15 ppm, and zinc from 28-54 ppm. Silver was not detected in any composite and selenium was present only in Sample CG-1A(Top) at 0.1 ppm.

Organotin compounds were detected only in the top composites. CG-1A(Top) contained a total of 47 ppb of organotins, of which 37 ppb was tributyltin. CG-1B(Top) contained 10 ppb of total organotins including 6 ppb of tributyltin.

Among organic constituents, sample CG-1A(Top) contained 24.7 ppb of DDT-related pesticides and 270 ppb of total PAHs. Sample CG-1B(Top) contained 15.7 ppb of DDTs, 15 ppb of PCB (as Aroclor 1254), and 200 ppb of PAHs. The bottom composites were virtually free of detected organics, with <0.5 ppb DDTs and <17 ppb of total PAHs. The total DDTs in both top composites exceeded the ERL value but were below the ERM.

Elutriate chemistry analyses showed that:

None of the four elutriates showed any measurable concentration of sulfide, oil and grease, petroleum hydrocarbons, or any of the organic contaminants analysed.

Organotins were measured in three of the four elutriates tested. Note, however, that the organotin levels in the harbor water (which was used to prepare the elutriates) exceeded those in any of the elutriates.

Metals, with the exception of chromium, mercury, and selenium, were detected in all elutriates and in the harbor water to prepare the elutriates. With minor exceptions, the metal concentrations in the elutriates were either lower than or only very slightly elevated over their concentration in harbor water.

The report then examines the significance of the above results in the context of marine resource protection:

The results of the chemical analyses of the sediment samples for contamination can best be evaluated by comparing them to the National Oceanic and Atmospheric Administration (NOAA) Effects Range Low (ERL) values and Effects Range Medium (ERM) values published by Long, et. al. (1995). Concentrations found below ERL values are expected not to produce a toxic effect. Concentrations greater than the ERM values will most likely have an effect. These available marine sediment screening levels developed by NOAA (Long, et. al. 1995) are summarized in Table 6. Individual concentrations in test sediments which exceeded either ERL or ERM screening levels are highlighted in Table 4. [See Exhibits 4 and 5 of this staff report.]

Among metal contaminants, all were below their ERL values and most were detected at 10 to 50% of those ERL values.

The 37 ppb of TBT in composite CG-1A(Top) was noteworthy; however, no ERL/ERM values are available for butyltin compounds.

The concentration of total DDTs in samples CG-1A(Top) and CG-1B(Top) exceeded the ERL values but were below the ERM value. All other organic contaminants detected were well below ERL levels.

Concentrations of metals in the elutriate samples were not appreciably increased over those in the ambient harbor water, and did not exceed EPA water quality criteria for salt water, or the California Ocean Plan water quality objectives for the protection of marine aquatic life. No organic compounds were detected in either harbor water or elutriates at the protocol specified detection limits.

The report concludes with the following:

The composite sediments from both the top and bottom of Area CG-1 were fairly coarse-grained sandy materials which were low in all chemical contaminants. In all respects, these sediments proposed for dredging and placement in the Pier 400 Landfill were found to be less chemically contaminated than most of the outer harbor sediments analysed during the initial evaluation phase for the landfill project (Kinnetic Laboratories/ToxScan, 1991). The present sediments thus appear to be a suitable source of supplementary fill material for Pier 400 and no water quality impacts are expected during dredging and/or disposal of these sediments.

The proposed dredging to deepen a section of the Main Channel in the Port of Los Angeles is an allowable use under Section 30705(a)(1) of the Coastal Act, and meets the design criteria of Section 30705(b) of the Coastal Act. When completed, the dredging will allow existing cargo terminals located on the Main Channel to accommodate fully-loaded, deep-draft vessels, and will provide needed and geotechnically suitable fill material to complete the Pier 400 Stage 1 landfill. The Commission must also find that the project conforms with Sections 30705(c) and 30708, and in particular that the project minimizes disruption to fish, wildlife, and marine habitat, and is designed and will be constructed so as to minimize substantial adverse environmental impacts. As noted above, the 400,000 cubic yards of sediments to be dredged from the Main Channel were sampled and tested for contaminate levels, found to be suitable for unconfined ocean disposal, and require no special handling. The results of the sediment chemistry testing also support the conclusion that dredging of the sediments will not release harmful levels of contaminants into the marine environment that could adversely affect aquatic life.

Dredging will increase the amount of sediment in the water column, but because the dredged sediments are primarily coarse-grained sands, increases in water column turbidity (and corresponding effects on light penetration and dissolved oxygen) will be short-term in nature, confined to the immediate project area during the two-month

operation, and not significant. Dredging will marginally deepen existing deep-water habitat and not eliminate more valuable shallow-water areas. Although dredging will adversely affect benthic habitat on the Main Channel floor, this area will recolonize quickly and impacts on marine habitat and resources will not be significant.

Upland disposal of the dredged sediments on the under-construction Pier 400 Stage 1 landfill, and any elutriate runoff from dewatering and drying of the sediments, will not degrade coastal waters nor adversely affect marine habitat or other coastal resources. To further ensure that the water quality policies of the Coastal Act are adhered to by the Port during dredging and disposal operations, the Commission conditions this permit to incorporate all Corps of Engineers Section 404 permit conditions and all Regional Water Quality Control Board Section 401 certification conditions attached to the Main Channel deepening project. In addition, the Commission conditions this permit to require the Port to submit all project monitoring reports to the Executive Director. With these conditions, the Commission will be able to review the results of dredging and disposal operations on water quality and marine resources in the Port and use those results in its review of the Port's upcoming port master plan amendment application for deepening the entire Main Channel. In conclusion, the Commission finds that as conditioned, the proposed project will not generate significant adverse affects on aquatic life and marine resources, and conforms with the coastal resource protection policies of Sections 30705 and 30708 of the Coastal Act.

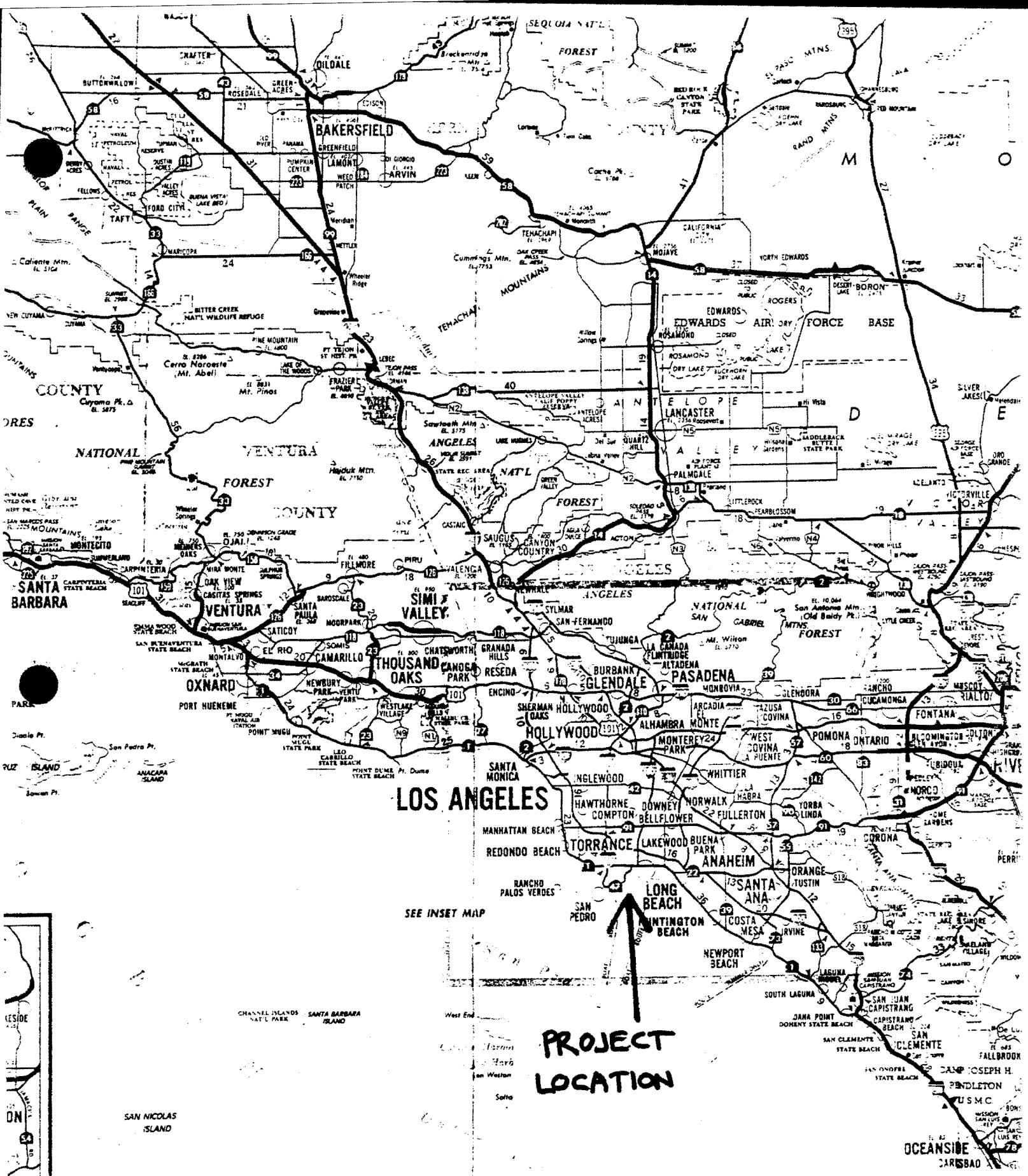
C. California Environmental Quality Act. Section 13096 of Title 14 of the California Code of Regulations requires Commission approval of coastal development permits to be supported by a finding showing the permit, as conditioned, to be consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(i) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impact which the activity may have on the environment.

The proposed project, as conditioned, has been found to be consistent with the Chapter 8 policies of the Coastal Act. All adverse impacts have been mitigated by conditions of approval and there are no feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impact which the activity may have on the environment. On June 26, 1996, the Port of Los Angeles certified the Addendum to the Deep Draft Navigation Improvements Project Final Environmental Impact Report, which includes the development included in the proposed project. Therefore, the Commission finds that the proposed project can be found consistent with the requirements of the Coastal Act to conform to CEQA.

ATTACHMENT

Standard Conditions

1. Notice of Receipt and Acknowledgment. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
2. Expiration. If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.
3. Compliance. All development must occur in strict compliance with the proposal as set forth in the application for permit, subject to any special conditions set forth below. Any deviation from the approved plans must be reviewed and approved by the staff and may require Commission approval.
4. Interpretation. Any questions of intent of interpretation of any condition will be resolved by the Executive Director or the Commission.
5. Inspections. The Commission staff shall be allowed to inspect the site and the development during construction, subject to 24-hour advance notice.
6. Assignment. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
7. Terms and Conditions Run with the Land. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.



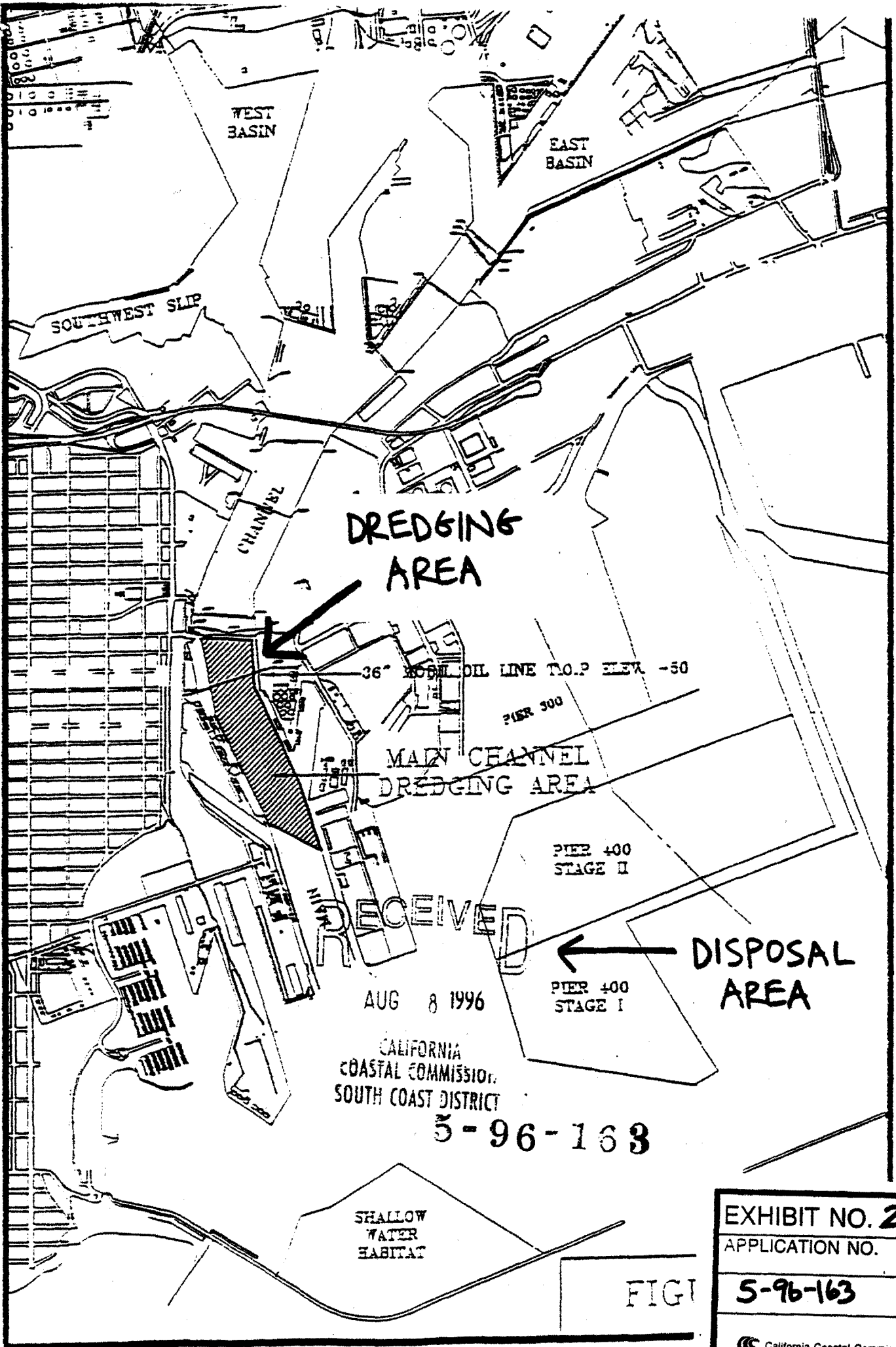
SEE INSET MAP

**PROJECT
LOCATION**

EXHIBIT NO. 1
APPLICATION NO.
5-96-163

SAN CLEMENTE U.S. MILITARY RESERVATION

ISLAND



DREDGING AREA

36" HOSE OIL LINE T.O.P. ELEV. -50

PIER 300

MAIN CHANNEL DREDGING AREA

PIER 400 STAGE II

RECEIVED

DISPOSAL AREA

PIER 400 STAGE I

AUG 8 1996

CALIFORNIA COASTAL COMMISSION SOUTH COAST DISTRICT

5-96-163

SHALLOW WATER HABITAT

FIGURE

EXHIBIT NO. 2
APPLICATION NO.
5-96-163
California Coastal Commission

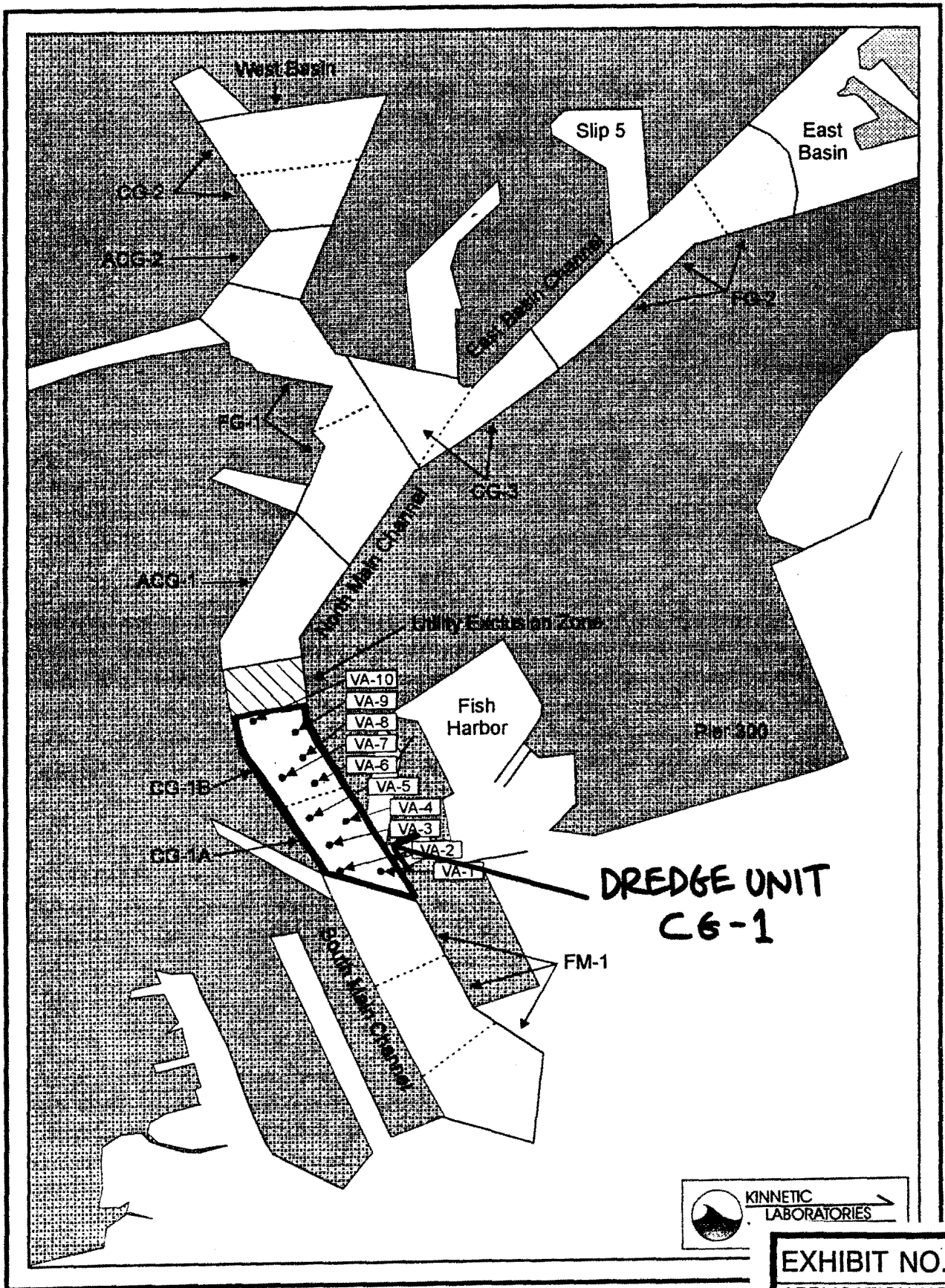


Figure 1. Vibracore Locations for the Port of Los Angeles, Pier 400 Borrow Project.

<p>EXHIBIT NO. 3</p> <p>APPLICATION NO.</p> <p>5-96163</p> <p>California Coastal Commission</p>

Table 4. Bulk Sediment Chemistry Summary: Port of Los Angeles, Channel Deepening, Phase I.

Analyte	CG-1A (TOP)	CG-1A (BOT)	CG-1B (TOP)	CG-1B (BOT)	D.L.
GRAIN SIZE (% dry)					
Sand ($-1 \leq \Phi \leq 4$)	78.7	92.9	90.1	82.7	--
Silt ($5 \leq \Phi \leq 8$)	13.9	5.0	7.5	13.2	--
Clay ($\Phi \geq 9$)	7.4	2.1	2.6	4.1	--
MISCELLANEOUS CHEMISTRIES					
Total sulfides (ppm, dry)	13	ND	1.3	ND	0.1
Water soluble sulfides (ppm, dry)	0.2	ND	ND	ND	0.1
Petroleum Hydrocarbons (ppm, dry)	ND	ND	ND	ND	100
Total oil & grease	ND	ND	ND	ND	100
% Solids (%)	75	80	79	81	0.1
TOC (%)	0.3	ND	0.2	ND	0.1
METALS (ppm, dry wt)					
Arsenic	2.3	1.6	0.7	0.4	0.1
Cadmium	0.2	0.1	0.1	0.1	0.1
Chromium	28	17	23	25	0.1
Copper	19	7.9	14	14	0.1
Lead	8.2	3.9	6.3	4.2	0.1
Mercury	0.07	0.04	0.09	0.06	0.02
Nickel	13	10	12	15	0.1
Selenium	0.1	ND	ND	ND	0.1
Silver	ND	ND	ND	ND	0.1
Zinc	54	28	50	53	1.0
ORGANOTINS (ppb, dry weight)					
Monobutyltin	3	ND	ND	ND	1.0
Dibutyltin	7	ND	4	ND	1.0
Tributyltin	37	ND	6	ND	1.0
Tetrabutyltin	ND	ND	ND	ND	1.0

ND = None Detected

EXHIBIT NO. 4
APPLICATION NO.

5-96-163

Table 4, continued. Bulk Sediment Chemistry Summary: Port of Los Angeles, Channel Deepening, Phase I.

Analyte	CG-1A (TOP)	CG-1A (BOT)	CG-1B (TOP)	CG-1B (BOT)	D.L.
CHLORINATED PESTICIDES (ppb, dry weight)					
Aldrin	ND	ND	ND	ND	0.31 - 0.33
alpha-BHC	ND	1.8	ND	0.91	0.31 - 0.33
beta-BHC	ND	ND	ND	ND	0.31 - 0.33
delta-BHC	ND	ND	ND	ND	0.31 - 0.33
gamma-BHC (lindane)	ND	ND	ND	ND	0.31 - 0.33
alpha-Chlordane	ND	ND	ND	ND	3.1 - 3.3
gamma-Chlordane	ND	ND	ND	ND	3.3
4,4'-DDD	0.72	ND	0.67	ND	0.31 - 0.33
4,4'-DDE	24	0.31	15	0.46	0.31 - 0.33
4,4'-DDT	ND	ND	ND	ND	0.31 - 0.33
Σ DDT's	<u>24.72</u>	0.31	<u>15.67</u>	0.46	--
Dieldrin	ND	ND	ND	ND	0.31 - 0.33
Endosulfan I	ND	ND	ND	ND	1.2 - 1.3
Endosulfan II	ND	ND	ND	ND	0.31 - 0.33
Endosulfan sulfate	ND	ND	ND	ND	6.2 - 6.7
Endrin	ND	ND	ND	ND	0.31 - 0.33
Endrin Aldehyde	ND	ND	ND	ND	0.31 - 0.33
Endrin Ketone	ND	ND	ND	ND	0.31 - 0.33
Heptachlor	ND	ND	ND	ND	0.31 - 0.33
Heptachlor epoxide	ND	ND	ND	ND	0.31 - 0.33
Methoxychlor	ND	ND	ND	ND	6.2 - 6.7
Toxaphene	ND	ND	ND	ND	18 - 20
PCBs (ppb, dry weight)					
PCB 1242	ND	ND	ND	ND	12 - 13
PCB 1254	ND	ND	15	ND	12 - 13
PCB 1260	ND	ND	ND	ND	12 - 13
total PCBs	ND	ND	15	ND	12 - 13
PAHs (ppb, dry wt)					
Naphthalene	ND	ND	ND	ND	9.2 - 10
2-Methylnaphthalene	ND	ND	ND	ND	9.2 - 10
2-Chloronaphthalene	ND	ND	ND	ND	9.2 - 10
Acenaphthylene	ND	ND	ND	ND	9.2 - 10
Acenaphthene	ND	ND	ND	ND	9.2 - 10
Fluorene	ND	ND	ND	ND	9.2 - 10
Phenanthrene	12	ND	ND	ND	9.2 - 10
Anthracene	ND	ND	ND	ND	9.2 - 10
Fluoranthene	21	ND	19	ND	9.2 - 10
Pyrene	39	ND	21	17	9.2 - 10
Benzo(a)anthracene	19	ND	12	ND	9.2 - 10
Chrysene	32	ND	30	ND	9.2 - 10
Benzo(b)fluoranthene	45	ND	44	ND	9.2 - 10
Benzo(k)fluoranthene	44	ND	42	ND	9.2 - 10
Benzo(a)pyrene	40	ND	34	ND	9.2 - 10
Indeno[1,2,3-CD]pyrene	19	ND	ND	ND	12 - 19
Dibenzo(a,h)anthracene	ND	ND	ND	ND	12 - 13
Benzo[ghi]perylene	ND	ND	ND	ND	12 - 20
total PAHs	270	ND	200	ND	9.2 - 20
total phthalate esters	250	170	210	ND	9.2 - 10

ND = None Detected

Bold & underline = Exceeds ERL

Table 6. Marine Sediment Screening Levels Developed by the National Oceanic and Atmospheric Administration (Long, et al 1995).

Analyte	ER-L	ER-M
Organic Compounds (ppb)		
Total PCBs	22.7	180
Total DDTs	1.58	46.1
Total PAHs	4,022	44,790
Metals (ppm)		
Arsenic	8.2	70
Cadmium	1.2	9.6
Chromium	81	370
Copper	34	270
Lead	46.7	218
Mercury	0.15	0.71
Nickel	20.9	51.6
Silver	1	3.7
Zinc	150	410
Effects Range - Low: The concentration below which adverse biological effects are seldom expected.		
Effects Range - Median: The concentration above which adverse biological effects are likely to occur.		

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