

24.3 Overall Evaluation

1. The result of EIA is summarized as follows.

Table 24-3-1 The Result of EIA

Item	Result of Evaluation
Air, Noise and Smell Quality	No significant impact by Short Term Plan. A new road bypassing the town area is proposed.
Water Quality	No significant impact by Short Term Plan. Appropriate countermeasures such as sewage processing system in inland areas are expected to be realized as soon as possible by all authorities concerned.
Terrestrial Ecology	No significant impact by Short Term Plan around the sites.
Displacement of Villages and Facilities	No significant impact by Short Term Plan (C-3) Careful coordination is required especially at the master plan stage concerning private piers (B-3)
Navigation Safety	Calling ships is limited in number.
Others	
Marine Pollution	No specific problem is anticipated.
Disposal of Dredged Material	No specific problem is anticipated. Dredged material is carefully disposed not to cause environmental pollution. Appropriate monitoring should be continued.
Employment	Remarkable effect is expected on the whole.

2. Impact of the project in the Short Term Plan on surrounding natural environment is small and negligible. On the other hand, direct and indirect employment will be created through its construction and operation.

3. The following environmental concerns and recommendations should also be noted:

- It is recommended that local government institutions establish a monitoring program of water quality in the bay area to evaluate the performance of their sewage treatment systems and solid waste programs.

- It is recommended that the local authorities initiate a large-scale reforestation program to restore native species.
- It is recommended that the local authorities initiate a program to recover some commercial marine fauna species, such as: *Anadara grandis* (Casco de Burro), *Palinurus sp.* (Lobster) which have been over exploited.
- It is recommended that the local authorities initiate an environment education program with the participation of environmental government organizations.
- The sunken ships and boats should be withdrawn from the areas where they could cause accidents in the future.
- The administrative office of the new port should establish and enforce specific rules for treatment of the sewage from the docking ships to avoid pollution in the port area.
- The administrative office of the new port should implement preventive measures to prevent oil spills from vessels, and prepare emergency response equipment and procedures to contain and clean-up accidental oil spills.
- The administrative office should stringently control vessel traffic during port construction to prevent serious accidents.
- It is strongly recommended to establish a program of cooperation with the respective government organizations of Honduras and Nicaragua to implement measures that will decrease the pollution of Fonseca Gulf.

25. OVERALL EVALUATION

1. Two alternatives, C-3 and B-3, are prepared and evaluated as the Short Term Plan. Main facilities are the same for both cases. They differ only in project site.

2. Viability of the project was evaluated from various points of view mentioned in the preceding chapters. These evaluations are summarized as follows.

25.1 Alternative C-3

3. Alternative C-3 is planned to the west of the existing Port of Punta Gorda, utilizing the area of the existing Port of Cutuco(CEPA-FENADESAL).

1) Engineering Soundness

4. The proposed construction site for new container and bulk berth at Cutuco is rational location due to calm marine condition throughout year as well as port access road. The topographic, bathymetric and geotechnical conditions have no significant engineering problems for construction of the port facilities. The adjacent high land located at the new port may be applied future expansion area after excavation as a borrow pit for the project.

5. Water area in front of the construction site is sufficient space for the work boats and maneuvering.

2) Economic Feasibility

6. The result of economic analysis in Chapter 22 indicates that EIRR of Case 1 and Case 2 is 18.2% and 17.0% respectively, which is sufficiently high from the economic viewpoint. A sensitivity analysis is conducted to check EIRR when basic conditions change. Even when costs increase by 10% compared with the base case and benefits decrease by 10%, EIRR registers 15.2% and 14.2% respectively.

7. Assuming the discount rate is from 8%-12%, NPV of Case 1 and Case 2 are US\$ 122 - 46 million and US\$ 107 - 37 million, while BCR of Case

1 and Case 2 is 2.13 - 1.55 and 1.99 - 1.44.

8. Accordingly, the short term development plan is economically feasible.

3) Financial Feasibility

9. The result of financial analysis in Chapter 23 indicates that FIRR of Case 1 and Case 2 is 9.3% and 8.7%, which exceeds the assumed weighted average loan interest rate. A sensitivity analysis is conducted to check FIRR when basic conditions change. Even when costs increase by 10% compared with the base case and revenue decreases by 10%, FIRR registers 6.9% and 6.3% respectively.

10. Accordingly, the short term development plan is financially feasible.

4) Environmental Aspect

11. There are no important or non-substitutive natural components in the project site of the Short Term Plan. The impact to environmental components in and around the site by the plan is small and negligible.

12. Appropriate control on disposal of dredged materials is recommended. Construction of a road bypassing the town area is also proposed. Regardless of the port project, in addition, a sewage treatment system to control inflows of inland pollutant should be realized as soon as possible with the cooperation of all authorities concerned.

13. On the other hand the Short Term Plan creates direct and indirect employment through its construction and operation, contributing to the regional development.

5) Conclusion

14. Based on the comprehensive judgment from various points of view including items mentioned above, Alternative C-3 is recommended for execution. The result of overall evaluation is summarized in Table 25-1-1.

Table 25-1-1 Overall Evaluation for Alternative C-3

Item	Result	Remarks
Engineering Aspect	Good	Berth construction sites are all in good condition for construction.
Economic Feasibility	Good	EIRR and related indices are good. Project greatly contributes to national foreign trade and regional development.
Financial Feasibility	Good	FIRR is good. Project has profitability.
Environmental Aspect	Good	Project has no significant environmental impact and contributes to local and national economy and social stability.

25.2 Alternative B-3

1. Alternative B-3 is planned to the east of the existing Port of Punta Gorda. Space for a marina (CORSAIN) and a power plant (CEL) is reserved.

1) Engineering Soundness

2. The proposed construction sites for new container and bulk berth are with favorable conditions. The topographic, bathymetric and geotechnical conditions have no significant problems for construction of the port facilities.

3. However, the proposed port site is located at comparatively shallow water and sea bottom layer with soft clay and silt. The dredging volume will increase compared with another site (C-3) for the basin notwithstanding short entering the port from ocean side.

4. Water area in front of the construction site is sufficient wide for work boats and maneuvering.

2) Economic Feasibility

5. The result of economic analysis in Chapter 22 indicates that EIRR of Case 1 and Case 2 is 17.3% and 16.1% respectively, which is sufficiently high from the economic viewpoint. A sensitivity analysis is conducted to check EIRR when basic conditions change. Even when costs increase by 10%

compared with the base case and benefits decrease by 10%, EIRR registers 14.4% and 13.4% respectively.

6. Assuming the discount rate is from 8%-12%, NPV of Case 1 and Case 2 are US\$ 117 - 41 million and US\$ 102 -32 million, while BCR of Case 1 and Case 2 is 2.03 - 1.47 and 1.90 - 1.36.

7. Accordingly, the short term development plan is economically feasible.

3) Financial Feasibility

8. The result of financial analysis in Chapter 23 indicates that FIRR of Case 1 and Case 2 is 8.7% and 8.2% respectively, which exceeds the assumed weighted average loan interest rate. A sensitivity analysis is conducted to check FIRR when basic conditions change. Even when costs increase by 10% compared with the base case and revenue decreases by 10%, FIRR registers 6.3% and 5.9% respectively.

9. Accordingly, the short term development plan is financially feasible.

4) Environmental Aspect

10. Careful coordination is required especially at the next stage, the master plan stage concerning private piers. There are no other important or non-substitutive natural components in the project site of the Short Term Plan. The impact to environmental components in and around the site by the plan is limited and small. Some private activities there could be relocated with an appropriate countermeasures if necessary.

11. Appropriate control on disposal of dredged materials is recommended. Construction of a road bypassing the town area is also proposed. Regardless of the port project, in addition, a sewage treatment system to control inflows of inland pollutant should be realized as soon as possible with all authorities concerned.

12. On the other hand the Short Term Plan creates direct and indirect employment through its construction and operation, contributing to the regional development.

5) Conclusion

13. Based on the comprehensive judgment from various points of view including items mentioned above, Alternative B-3 is recommended for execution. The result of overall evaluation is summarized in Table 25-2-1.

Table 25-2-1 Overall Evaluation for Alternative B-3

Item	Result	Remarks
Engineering Aspect	Good	Berth construction sites are all in good condition for construction.
Economic Feasibility	Good	EIRR and related indices are good. Project greatly contributes to national foreign trade and regional development.
Financial Feasibility	Good	FIRR is good. Project has profitability.
Environmental Aspect	Good	Project has no significant environmental impact and contributes to local and national economy and social stability. Some private activities there could be relocated with an appropriate countermeasures if necessary.

25.3 Conclusion

1. In order to select the best alternative, the comparative evaluation of two alternatives, B-3 and C-3, is summarized as shown in Table 25-3-1.

Table 25-3-1 Comparative Evaluation of the Alternatives

Evaluation	Alternative Plans	
	B-3	C-3
Terminal Plan	○	○
Land Access	○	⊙
Water Area Plan	○	○
Water Access	⊙	○
Effect on Existing Piers	△ Private piers	○
Use of Neighboring Area	○	⊙ Old Cutuco ^(*)
Future Expansion	⊙ Bulk terminal	⊙ Container terminal
Construction Cost	○ US \$ 101 million	⊙ US \$ 94 million
Environmental Impact	○	○
Effect on Other Projects	⊙ Marina, Power plant	⊙ (Punta Gorda)
Overall Evaluation	○	⊙

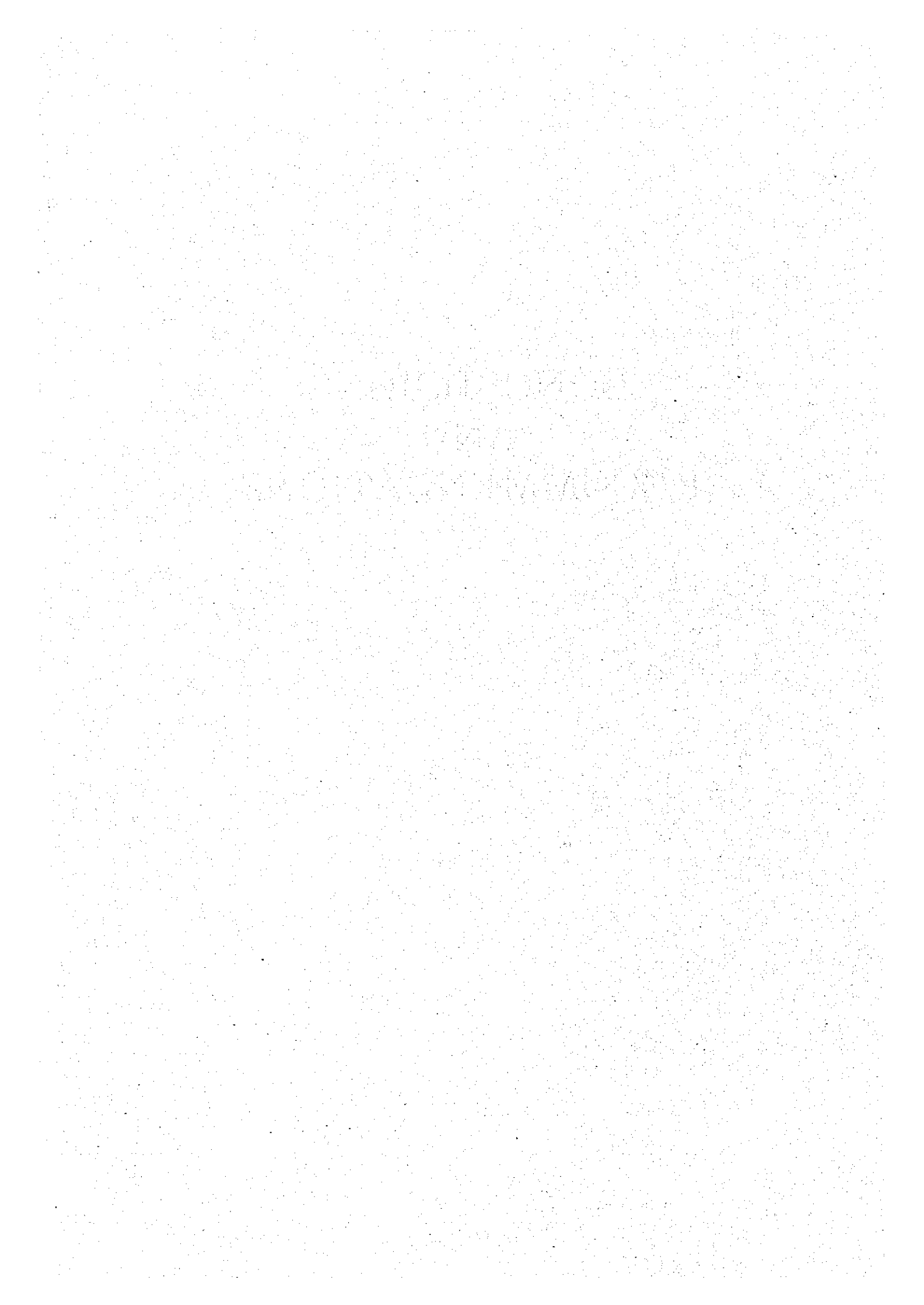
Note1: ⊙ Good
 ○ Fair
 △ Poor

Note2: The existing Cutuco is fully available for the project already.

2. Basically, C-3 was prepared to facilitate project implementation if the site around the existing Cutuco became available for the Study. C-3 has become a valid alternative since no appropriate concession proposal was submitted for the said Cutuco. As a result, C-3 is selected due to its advantages in terms of cost and availability of the existing area of the Port of Cutuco (CEPA).

3. As well, the results of economic and financial analysis of C-3 are better than those of B-3 thanks to the more economical construction cost (7% less). In addition, it is not necessary to coordinate with private piers in C-3. For more details, please see the previous sections of 25.1 for C-3 and 25.2 for B-3, and Table 25-1-1 for the overall evaluation of alternative C-3.

**CONCLUSIONS
AND
RECOMMENDATIONS**



CONCLUSIONS AND RECOMENDATIONS

1. The Study Team has formulated this report based on the findings and materials obtained through its own activities, cooperation with counterparts and interviews with many people related to this project. In the course of the Study, discussions within the team and counterparts have been held repeatedly to ensure a fruitful outcome.

2. While detailed explanation of results of the Study are expressed in the main parts of the text of the report, issues which are assumed to be most useful for considering the implementation of this proposed project are summarized here for the readers' convenience.

CONCLUSIONS

3. This Study has been executed in order to ensure the development and modernization of national ports, especially in La Union Province, and their contribution to the regional development of the eastern area, which are now included in the most important policies in the Republic of El Salvador.

4. In accordance with the scope of work between both governments of El Salvador and Japan, the Study Team has

- (1) formulated the Master Plan for the Port of La Union with the target year 2015 for the development of container and bulk terminals and other related facilities, and
- (2) conducted a feasibility study of a Short Term Plan up to the target year 2005 within the framework of the Master Plan

5. Total cargo volume for the port forecasted by employing a future economic framework based on actual facts and related figures acquired during the Study, will be around 2.0-2.2 million tons in 2015. It includes container cargo volume of 130-158 thousand TEUs from the whole country, which Acajutla, sometimes affected by a swell, cannot handle. The other cargoes come from the said area.

6. To meet these demands, the development of new terminals with modern and efficient container handling systems will be essential to take

the advantage of geographical and natural conditions facing the La Union bay. (The existing Cutuco is too old to be reactivated, and the neighboring Punta Gorda has started to work as fishing base as originally planned.)

7. The necessary number of terminals estimated by the Team is as follows;

One(1) container terminal, equipped with two(2) gantry cranes
Two(2) bulk terminals
Other related facilities such as access channel and road

8. Settlement of Export Processing Zones (EPZs) are proposed as important measures closely related to the development of the port to activate the local economy, considering the good performance of those in the western/ central region.

9. The cost needed for the development of the port is estimated to be around 150 million US dollars.

10. Public sector should retain the overall control of the port, providing basic infrastructure such as piers and creating an attractive and competitive environment for private participation. As to CEPA, its modernization is also required, which includes formulation of basic policy and plan for national ports, improvement of statistical system and reinforcement of organization.

11. In the Short Term Plan, the following development works will be necessary up to 2005. In particular, the container terminal must become operational as soon as possible.

One(1) container terminal, equipped with two(2) gantry cranes
One(1) bulk terminal
Other related facilities such as access channel and road

12. The quay walls of these two terminals are consecutive and constructed with almost the same specifications for flexible usage at need.

13. Among various sites, the two best sites have been selected and examined for the feasibility study. The construction cost for the above two terminals is estimated at 100 million US dollars, which also includes

access channel and road, container handling equipment and tug boats, etc. Over 20 % of the cost is estimated as the portion in local currency.

14. The Economic Internal Return Rate (EIRR) calculated based on the countable benefit is more than 13 %. The Financial Internal Return Rate (FIRR) is more than 5 %. Moreover, related indices are also highly evaluated. As a result, the project is judged as being feasible, both economically and financially.

15. No significant technical problems are found in the water area or concerning the soil conditions at the project site. Furthermore, the EIA revealed no significant unfavorable impact. Some private activities there could be relocated with an appropriate countermeasures if necessary.

Table-1 Overall Evaluation

Item	Result	Remarks
Engineering Aspect	Good	Berth construction sites are all in good condition for construction.
Economic Feasibility	Good	EIRR and related indices are good. Project greatly contributes to national foreign trade and regional development.
Financial Feasibility	Good	FIRR is good. Project has profitability.
Environmental Aspect	Good	Project has no significant environmental impact and contributes to local and national economy and social stability. Some private activities there could be relocated with an appropriate countermeasures if necessary.

16. Of the two project sites, that between the Port of Cutuco and Punta Gorda would be preferable in terms of cost and availability of the existing area of the Port of Cutuco (CEPA).

17. The proposed project is a great expense to the government. However, it should be implemented, taking into consideration its importance to national port development and regional development and the favorable financing which can be utilized at present.

RECOMMENDATION

1. To ensure the smooth implementation of this proposed plan of the port of La Union, the Study Team recommends the following items.

Nature of Public Ports

2. Public ports should be considered as economic infrastructure, or social capital, or as a national asset, in such a country as El Salvador where they are vital in promoting the national economy and upgrading total welfare of the citizen. The Port of La Union will be the only one real container terminal in El Salvador. This kind of container terminal should be open for public use. Ports have to be controlled properly to preserve the national and regional benefit and keep fair use for public.

3. Under this concept, ports should be supervised by the public sector. At the same time, basic policy of port development and management and arrangement of basic facilities should be controlled by the public sector. The public sector also has an advantage in that it can obtain low interest loans from foreign organizations for the construction of basic facilities.

4. It is also very important to understand that the port services could be provided by private business entities in such well-cultivated fields where they can promote their economic activities freely under a liberalized competitive market seeking efficiency. The public sector as a supervisor and an owner of the port should take full responsibility for public profit.

5. In addition to the above mentioned points, it is also fairly justified that the land and water area as well as major port facilities should be supervised by the public sector to secure sound, effective and harmonized port development and activities coordinating with authorities and persons concerned.

Importance of the Master Plan

6. The basic role of the Master Plan is to act as a guideline for (1) development of port facilities, (2) port administration, and (3) coordination

with other plans and works.

7. The Master Plan should first be understood as the physical layout plan of port facilities and related land use to cope with the future demand. It shows not only rough requirement but also desirable zoning plan in the target year. All developments of various time spans from very urgent (2-3 years), short (5-10 years) to long term (10-20 years) are well coordinated under a long-term strategy. Based on the plan, efficient and organized port development can be achieved. Related development should be compatible with the plan to avoid haphazard development, the effects of which on a limited coastline may be irreversible

8. Similar to the above, proper administration system will be included in the Master Plan. In this sense, the functional allotment between public sector and private sector is an important issue. The functions of public sector and those of private sector will be specified and determined, depending on whether the corresponding port is designated as a public port, private port, commercial port or industrial port. As with the physical layout plan, a stage plan culminating in a long term vision is required. Furthermore, such information must be provided to the private sector in partially to ensure a competitive environment. However, alternative conditions for private investment should be secured under the overall supervision and administration of the public sector.

9. Finally, it should be emphasized that the port development is largely affected by surrounding national and regional development. The port can not demonstrate its full potential without the timely and proper arrangement of infrastructure such as roads and EPZs. In this regard, the plan could be utilized for coordination with other public plans work, even private ones. In this context, regional development will also be promoted and accelerated.

Concept of the Master Plan for La Union

10. As explained repeatedly, the Master Plan is a guideline for organized port development in future. Therefore, basic zoning plans for various activities are very important. As well, as much future expansion space as possible should be reserved for the Post-Master Plan stage.

11. In case of Alternative C-3, which has the lowest construction

cost among alternatives, cargo handling activities are planned to the west of Punta Gorda, while fishing activities would be well arranged around Punta Gorda. As to cargo handling, cargoes related to containers are handled at the west terminal, which could be expanded easily further west.

12. Remaining bulk cargoes are planned to be handled at two berths between this container terminal and Punta Gorda. To cope with the increase in cargo expected there, the introduction of modern efficient equipment would be the first option. Expansion of the terminal area would not be necessary until a later stage.

13. On the other hand, passenger cruisers are strongly expected to visit La Union. Therefore, a tentative mooring facility, utilizing the west revetment of the land reclamation, is planned to accommodate them as a minimum requirement. It could accommodate the ships of up to 15,000 GT at present. (However, it would not be available once the next expansion of the container terminal begins.)

14. Given the increase of passenger ship calls together with the tourism development of La Union, a passenger terminal should be planned properly in the Master Plan of the bay. It might be constructed around the east of Punta Gorda as part of the tourism development plan which is being studied by CORSAIN or, for example, in front of the town area around the existing passenger ports for islands. At any rate, construction of a passenger terminal in La Union should be incorporated into fundamental policy for tourism both nationally and of locally.

15. Finally, whether the container terminal can attract a large number of containers depends on the rapid implementation of the new by-pass road for urbanized area of the City of La Union from the Port of La Union. The existing principal road between the Cities of La Union and San Miguel should also be improved as soon as possible.

Systematic and Flexible Planning and Project Implementation

16. The system of port planning should be established. It is necessary that the nation-wide port development policy should be authorized at first and under that policy the plan of each port should be prepared.

17. In order to realize the proposed schemes of the plans, it is essential that CEPA promote full understanding of the plan, secure adequate financial support with proper budgetary arrangements and periodically review the plan to cope with national and regional changes.

18. All the facilities specified in the Master Plan reflect the forecast data of cargo demand together with type of cargo. However actual figures may deviate from the forecasts due to changes in various social and economic factors. Although a detailed study to cope with such changes would be required on such an occasion, following countermeasures may be useful to ensure future preparedness at time of need.

- (1) review of cargo forecast based on the latest data
- (2) review of the Master Plan
- (3) review of the implementation schedule
- (4) review of the progress of modernization program
- (5) review of the improvement of cargo handling efficiency

Importance of Surrounding Area for Port Related Activities

19. For a port to fulfill its function and to ensure economic success, good coordination with the surrounding area as well as the road network system is required. For that purpose, the port management body shall administrate and promote the use of the areas closely related to port activity under its basic policy.

20. In C-3, the areas just behind the port (*) are of course very important for the development of the port. In the Study, therefore, it is recommended that they should be used for future port related activities.

(*) The west part of the area is owned by CEPA and private citizens, while the east part is owned exclusively by CORSAIN. The cost of obtaining this land is not included in the project cost estimate in the Study.

Examples of land use are as follows;

1. Back-up area for cargo storage and distribution
 - a) oil tanks for expansion
 - b) silos and warehouses for expansion

- c) container storage yard for expansion
 - d) cargo distribution center (car, etc.)
2. Port administration and related business
- a) government offices and shipping agents
 - b) banks and insurance companies
 - c) service center for cruise passengers
 - d) commercial complex (including duty-free shops)
 - e) others

21. The appropriate land use could be guided (a) with good coordination between persons concerned, (b) under proper legal schemes or (c) through land acquisition by CEPA.

22. The most practical approach would be for CEPA to acquire the area and administrate it as the owner so that planned land use can be realized (see Figure 1).

Required functions for CEPA

1) Control of Port Area, Infrastructure and Facilities

23. CEPA should recognize the basic role and importance of master plan for the port development, and coordinate the overall projects concerned with port activities so that mutual interference will be avoided. In other words,

- (1) CEPA should formulate basic policy for national ports and prepare plan concerning development and conservation of port area.
- (2) Construction work, permission for usage of port infrastructure, facility and area should conform to the port policy and plan.

2) Organization improvement

24. In order to realize efficient port management and operation related to a basic policy and plan and ensure sound finance for the port development, it is necessary to introduce or reinforce sections which are in charge of the following functions:

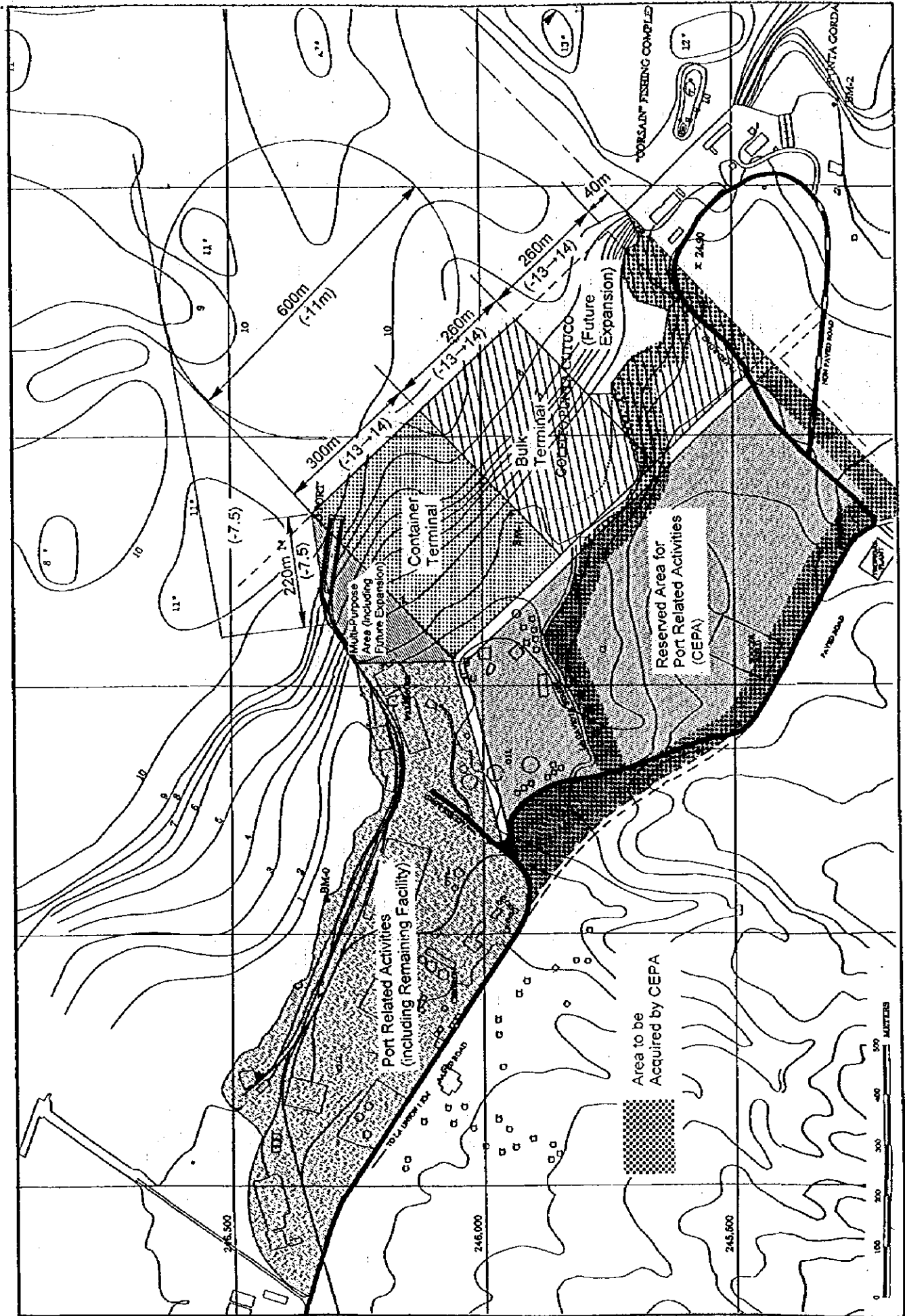


Figure 1 Area to be Acquired

Table-2 Required Functions for CEPA

Expected Role	Background
-Functional Port Planning and Arrangement -Supervision of New Terminal Construction	← New Terminal in La Union ← Joint Participation of CEPA and Private Enterprise in the Port of Acajutla, ← Dry Cannal, EPZ
-Active Marketing and Port Promotion -Attractive Tariff and Efficient Cargo Handling	← Progress of Containerization ← Competition among the Neighboring Ports ← Modernization Program of Public Sector
-Environmental Administration	← Prevention of Sea Area Pollution ← Raising Environmental Consciousness
-Flexible and Effective Reorganization	← New Role & Function for the Progress of Port Development and Modernization Plan

Port Promotion Strategy

25. Port promotion or sales is one of the most important fields of activities for attracting port users. CEPA does not seem very active in pursuing potential clients. In this respect, the following actions are recommended in securing an adequate level of revenues from users at the Ports of La Union and private participation port activities.

- 1) Establishment of port promotion strategy focusing on the respective target groups of users.
- 2) CEPA staff should have meetings regularly for sales at shipping companies or shippers, through active appeals in getting their understanding on the real merits of utilization of the Port of La Union such as reliability, efficiency and competitive tariff.
- 3) It is also useful for effective sales activities to prepare an attractive brochure in which the sales points including various advantages and merits for the corresponding target users are clearly explained.
- 4) To hold seminars to introduce the Port of la Union to shipping companies or shippers of various countries especially on the Pacific, such as the west coast of U.S. and Asia, is another effective way to assist the promotion activities.

Private Participation Policy

26. Under the basic understanding on the nature of public ports illustrated in para.1, it is recommended that the following guidelines be taken into account when CEPA introduces private participation.

1) The ultimate objective of private participation in port operation is to maximize economic return from the target port activity for both the public and private sectors under careful consideration on effective removal of possible inefficiency of public sector as well as adverse effects of monopoly by private sector.

2) Port functions and activities to be provided by private sector should be limited within the areas where the private participation can be fully controlled under the administrative authority CEPA, and the areas where the effects of the private participation can be fully expected without any negative impact to sound performance of the port for the public use.

3) The target areas to which private participation will be introduced should be planned and arranged appropriately to guarantee the necessary conditions under which the free market system can be fully activated.

4) Basic port facilities and major cargo handling equipment should be owned by public sector and open to public use, but can be leased out to private firms on a contract basis for their exclusive use under appropriate conditions. This is also understood as an incentive for private participation as investment in facilities and equipment is not required and flexible operation is possible.

5) Practice of private participation should be step wise considering its applicability to the situation of each target stage including practicality, acceptability, and profitability of the intended private participation schemes so that they could fully contribute in securing the total efficiency of port administration and its performance.

Training of Terminal Operation Staff

27. Training of terminal staff including container handling workers is one of the areas that can not be achieved by improvement of physical facilities or cargo traffic control system. Since improvement of human ability requires a rather long time under a well designed systematic education and training program, it is recommended that CEPA should start the necessary action as soon as possible. From the early days before the port starts operation, it is one effective way to invite a long-term expert on port management from developed countries such as Japan.

28. It may also be useful for the Port of Acajutla staff in charge of cargo handling works to be moved to the Port of La Union in order to transfer the know-how of container handling to the private sector. The private sector would benefit from the knowledge of the actual port conditions that these employees will bring to the operation.

Suggestion on Procurement Policy for Required Funds

29. In constructing a public port, public funds should be utilized to the extent possible. These include funds allocated by the government for the project in the national budget, and the internal resources of CEPA. As well, the funds from international multi or bilateral financing agencies (ODA: Official Development Assistance), should be utilized. In many cases in developing countries the latter funds are fully utilized, considering that the national funds are usually limited and that concessional terms of such loans are favorable.(for example, OECF loan of Japan can be used to cover up to 75% of the project cost with an interest rate of 2.2% and a repayment period of 25 years)

30. In any case, however, interest free internal resources should be utilized as much as possible to minimize future debts. Fortunately, CEPA is also in charge of the international airport, which can generate substantial revenue through successful operation and expansion. This is also able to be considered as a good resource. At the same time, CEPA is also subject to a 25% income tax on profit, and then a further 25% contribution tax is levied on the balance, which also could be used to construct new port, as the project will promote regional development (The regional development is the responsibility of the government). In this sense, exempting CEPA from these kinds of taxes would improve the financial soundness of the project especially during construction and the early stage of operation.

31. Finally, the project may attract some private investment. In this case, these funds could be utilized after reviewing the nature of the investment. To safeguard the principle of public use, it is important to ensure that monopolistic practices do not arise. Taking into consideration the above, the feasibility of project together with well-balanced profits for each investment party has to be secured.

Effective Implementation Work of the Project

32. The subsoil conditions might be a little complicated based on the existing geographical conditions around the sites. In particular, the rock encounter to the alignment of the quay walls is one of the dominant elements for the project implementation. Detailed subsoil investigation covering whole the project site, including the dredging area of the channel, is desirable. A seismic refraction survey would also be considered efficiently.

33. As well, topographic maps at the sites for major structure such as port office, custom office and pumping station, should be prepared in scale of 1:1,000 and with contour intervals of 1.0m. Those covering proposed quarry sites for rock materials and borrow areas for reclamation materials are also necessary.

34. A lot of dredged materials will be produced in dredging the approach channel and turning basin or in getting rid of the soft clay under the quay structures. If sandy soils and gravels are found, they should be used as filling materials for the site from the viewpoints of environmental consideration and construction cost reduction.

35. In view of the existence of the soft clay layer at the landfill area, the filling work is desirable to be carried out as much as possible in advance at the first stage development so that the subsoil consolidation settlement can be expedited before the port operation starts. If possible, settlement observation at the site is desirable, although overlay could resolve the problem.

36. For smooth implementation of the project, proper engineering services in detailed designs, pre-construction services and construction supervision would be one of the key factors in accordance with the proposed schedule of the Study. The preparations for it should also be remembered, if necessary.

Establishment of Effective Maintenance System

37. In the case of the Port of Cutuco, there are several structures and facilities which require periodical maintenance work while some of them require urgent rehabilitation.

38. Maintenance work of structures can be divided into two categories, routine maintenance and urgent rehabilitation. The former consists of preventive measures and relatively small repairs in which cost is minor, however the latter consists of corrective measures against large scale damage and required cost is large. Past experiences reveal that if preventive maintenance is appropriately performed at adequate intervals of time, maintenance cost can be minimized.

39. In case of the Port of La Union, maintenance of channel depth might be one of the most important issues. Therefore, regular sounding survey and implementation of maintenance dredging, especially outside of the bay, should be done timely according to the result of the survey.

Promotion of Eastern Area Regional Development

40. The development of the Port of La Union should be planned according to the strategy for introducing port related industry and stimulating regional development in addition to reinforcement of maritime transport infrastructure. It is thus necessary to consider the relationship between regional development and port activity

41. At present, around the Port of La Union a concrete plan of eastern regional development has not been drawn up yet. Government should draw up a concrete plan of eastern area regional development as well as a road construction plan immediately. And then, these plans should be executed by the initiative of the government. Government should create an environment where the private sector can easily participate in major eastern area projects such as EPZ as well as port activities.

Economic Impact to Eastern Regional Development

42. As is commonly understood, a port is dependent on the various activities in its hinterland or surrounding areas. At the same time, such activities relating to the ports can not run well without the necessary port functions. In this case, the promotion of regional development with a port as its core is considered vital in maximizing economic and social benefits expected from the port activities.

43. According to the forecast cargo volume of El Salvadoran ports,

the present capacity of Acajutla port is insufficient for the future demand, even if cargo handling equipment is improved. It is necessary to radically transform Acajutla port to cope with this demand. However, to convert Acajutla port into a competitive container terminal, it would be necessary to construct a large scale breakwater and a new container terminal with a container stacking area equivalent to that of neighboring foreign ports. On the other hand, it would not be necessary to construct any breakwater in planning a new port in La Union because the gulf of Fonseca is well sheltered by many isles and capes. In this regard, the investment cost in La Union is no more than the additional investment in Acajutla.

44. In addition, construction of La Union new port will accelerate economic development of the eastern region. It would have an impressive impact on the eastern region, as the social infrastructure has not been arranged sufficiently there yet. As a result, it will play a significant role in reducing the economic difference between both regions.

45. Since gulf of Fonseca faces Honduras and Nicaragua, La Union new port may also be able to attract cargoes from these countries and to function as a key regional distribution port and exchange base. The geographical advantage of La Union new port could be expected to promote economic and cultural exchange in Central America through trade and industrial relations.

46. Container port is a capital intensive industry where scale merit can be expected in terms of efficiency. As a large scale and efficient terminal attracts more ship services and more frequent ship services are more convenient for the exporter or consignee, to concentrate the Salvadoran container cargoes to La Union new port will heighten the efficiency of terminal operation and competitiveness of Salvadoran products.

47. Factories located in the port area such as EPZs can enjoy the full benefit of reduced transportation cost for getting materials and shipping products. Procurement of a huge volume of materials and equipment for new port construction and redevelopment of the eastern region will activate construction related industries. In addition, the eastern region will be able to take advantage of the many well-trained workers who gained valuable experience in the United States during the civil conflict. These workers are especially suited to the international

service sectors.

48. The smooth economic growth after the peace agreement reflects the favorable increase of trade volume. The construction of La Union new port will promote the rebuilding of the Eastern region and greatly contribute to the economic growth of the whole nation. Therefore, it is expected that the development of La Union new port will begin as soon as possible.

Environmental Consideration

49. Environmental issues cover a wide scope. Therefore, the environmental policy should be comprehensive, covering institutional frame and technical know-how. Needless to say, the corresponding section should be established in CEPA as soon as possible. Some basic elements in the above policy are listed below.

- (1) Clear understanding of the present situation of environment
- (2) Estimation and forecasting of the impact and future situation
- (3) Possible countermeasure to prevent the impact
- (4) Process to acquire social consensus
- (5) Coordination with other organizations concerned

50. There are many kinds of environmental components related to the port. The water front zone, in particular, has various features from the environmental viewpoint. Therefore, one of the most important issues in the first stage is clearly understanding the environment of the port in question.

51. When planning port development projects, careful consideration should be given to the possible effects which may happen during the port construction stage as well as operation stage. If degradation of environment is forecasted, countermeasures should be taken to prevent the environmental burden.

52. Results of the environmental analysis sometime remains at a qualitative level. The evaluation of projects is often relative and decisions should be made through social consensus.

53. Environmental issues cover a wide scope, thus, the

countermeasures to the issues should be examined and carried out through coordinated efforts of related organizations such as the Ministry of Environment and Natural Resources and related local administrative organs.

54. The function of collecting information, understanding and evaluating what is happening and what will happen in the port, know-how on necessary countermeasures for environmental problems should be carried out by CEPA as with the project of the Study.

APPENDIX

APPENDIX 1

Appendix 1 ENVIRONMENTAL SURVEY
- TABLES, MAPS AND PHOTOGRAPHS

Table	1	Flora	Tree Species of the Study
Table	2	Flora	Tree Species of Area and Surrounding
Table	3	Fauna	Mammals and Reptiles of the Study Area
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Exhibit	1		Organization Chart Ministry of Environment and Natural Resources
Exhibit	2		Municipalities of the Province of La Unión
Exhibit	3		Photograph - Old Vessels in Process of Sinking
Exhibit	4		Photograph - Pollution by Old Vessels
Exhibit	5		Settlements in the Study Area
Exhibit	6		Hydrography in the Area of the Study
Exhibit	7		Photograph - Polluted Area

Table 1 Flora Tree Species of the Study

COMMON NAME	SCIENTIFIC NAME
Tihuilote	Cordia alba
Chilindrón	thevetia peruviana
Palo Jiote	Bursera simaruba
Carao	Cassia grandis
Mangle	Rhizophora mangle
Jocote	Spondias sp
Capulín	Muntingua calaburra
Tempate	Jatropha curcas
Iscanal	Acacia cornigera
Conacaste	Enterolobium adinocephalum
Amate	Ficus sp
Guarumo	Cecropia sp

Table 2 Flora Tree Species of Area and Surrounding

FAMILY	SCIENTIFIC NAME	COMMON NAME
Anacardaceae	<i>Anacardium occidentale</i>	Marañón
	<i>Mangifera Indica</i>	Mango
	<i>Spondias sp</i>	Jocote
Annonaceae	<i>Annona cherimola</i>	Anona poshte
Apocynaceae	<i>Plumeria acutifolia</i>	Flor de mayo
	<i>Rauwolfia heterophylla</i>	Matacoyote
	<i>Stemmadeniaglabra</i>	Cojón de puerco
	<i>Sciadendron excelsum</i>	Lagarto
Araliaceae	<i>Arrabidaea millissima</i>	Chupachupa
Bignoniaceae	<i>Crescentia alata</i>	Morro
	<i>Crescentia cujete</i>	Júcaro
	<i>Tabebuia chrysantha</i>	Cortez amarillo
Bombaceae	<i>Ceiba pentandra</i>	Ceiba
Borraginaceae	<i>Cordia allodora</i>	Laurel
	<i>Cordia alba</i>	Tihullote
Burseraceae	<i>Busera simaruba</i>	Glote
Caricaceae	<i>Carica papaya</i>	Papaya
Ceasalpinaceae	<i>Bahulinia aculeata</i>	Casco de venado
	<i>Bauhinia unguolata</i>	Pié de cabra
	<i>Cassia grandis</i>	Carao
	<i>Tamarindus indica</i>	Tamarindo
	<i>Muntingea calabura</i>	Capulín
	<i>Astrotonium gravealeus</i>	Ronrón
Euphorbiaceae	<i>Croton reflexiofolius</i>	Copalchi
	<i>Jatropha curcas</i>	Chilamate
	<i>Casearia sylvestris</i>	Huesillo
Flacourtiaceae	<i>Xylosoma flexuosum</i>	Aguja de arra
Hernandiaceae	<i>Gyrocarpus americanus</i>	Tambor
Lurantahceae	<i>Psittacanthus sp.</i>	Matapalo
Malpichiaceae	<i>Byrsonima crassifolia</i>	Paraiso
	<i>Cedrela odorata</i>	Cedro

Table 3 Fauna Mammals and Reptiles of the Study Area

COMMON NAME	SCIENTIFIC NAME
Tepescuintle	<i>Dasyprocta punctata</i>
Mapache	<i>Procyon lotor</i>
Cusuco	<i>Dasypus novemcinctus</i>
Gato onto	<i>Felis yagouaroundi</i>
Gato montés	<i>Urocyon cinereoargenteus</i>
Zorrillo	<i>Spilogale putorius</i>
Conejo	<i>Sylvialagus floridanus</i>
Tacuazán	<i>Sidelphis marsupialis</i>
Ardilla	<i>Sciurus variegatoides</i>
Murciélago	<i>Glossophaga sp</i>
Garrobo	<i>Ctenosaura similis</i>
Iguana	<i>Iguana iguana</i>

Table 4 Fauna Birds of the Study Area

COMMON NAME	SCIENTIFIC NAME
Pelícano	<i>Pelecanus occidentales</i>
Fragata	<i>Fragata magnificens</i>
Zope común	<i>Coagyps atratus</i>
Gavilán	<i>Ruteo brachyurus</i>
Codornis	<i>Colinus leucopogon</i>
Chacha	<i>Ortalis leucogastra</i>
Alzaculito	<i>Actitis macularia</i>
Playerito	<i>Calidris mauri</i>
Paloma de mar	<i>Sterna nilotica</i>
Tortolita	<i>Columbina talpacoti</i>
Ala Blanca	<i>Zenaida asiatica</i>
Chocoyo	<i>Aratinga canicularis</i>
Pericón verde	<i>Aratinga holocchlora</i>
Catalnica	<i>Brotegeris jugularis</i>
Pijuyo	<i>Crotophaga sulcirostris</i>
Plátano asado	<i>Playa cayana</i>
Colibrí	<i>Amaxilia rutila</i>
Aurora	<i>Trogon elegans</i>
Talapo	<i>Eumamota superciliosa</i>
Torogoz	<i>Momotus momota</i>
Golondrina	<i>Progne chalybea</i>
Urraca	<i>Calocitta formosa</i>
Guacalcha	<i>Campylorhynchus rufinucha</i>
Zenzontle	<i>Turdus gravi</i>

Table 5 Fauna Fishes, Mollusks, Crustaceous and Batrachians of the Study

FAMILY	SCIENTIFIC NAME	COMMON NAME
Sciaenidae	<i>Stellifer erycymba</i>	Corvinillas
Sciaenidae	<i>Stellifer</i> sp	Corvinillas
Sciaenidae	<i>Bairdiella chrysoleuca</i>	Corvinillas
Gerreidae	<i>Diaptrus peruvianus</i>	Huesudas
Sphyraenidae	<i>Sphyraena ensis</i>	Picudas
Sciaenidae	<i>Larimus effulgeus</i>	Guabinas
Stromateidae	<i>Peprilus snyderi</i>	Tilosas
Polynemidae	<i>Polydactylus approximaus</i>	Gatas
Tetraodontidae	<i>Sphoeroides tricocephalus</i>	Sapos
Dasyatidae	<i>Dasyatis</i> sp	Rayas
Pomadasyidae	<i>Pomadasyus panamenses</i>	Rucos
Arridae	<i>Galeichtys peruvianus</i>	Bagres
Arridae	<i>Arius troschelli</i>	Guichos
Lutjanidae	<i>Lutjanus gullatus</i>	Pargos
Mullidae	<i>Pseudupeneus grandisquamis</i>	Palometa
Batrachoididae	<i>Porichthys nautopaedium</i>	Frayles luminosos
Centropomidae	<i>Centropomus medius</i>	Robalos
Sphyridae	<i>Sphyrna lellini</i>	Tiburones martillo
Loliginidae	<i>Loliguncula panamensis</i>	Calamares
Portunidae	<i>Portunus</i> sp	Jaibas
Bothidae	<i>Ertropus crossotus</i>	Caites
Penaeidae	<i>Penaeus stylirostris</i>	Camarones blancos
Penaeidae	<i>Penaeus brevirostris</i>	Camarones rojos
Penaeidae	<i>Penaeus vannamei</i>	Camarones blancos
Portuneidae	<i>Callenectes</i> sp	Jaibas
Palinuridae	<i>Panulirus gracilis</i>	Langostas
Mytilidae	<i>Mitella guyanensis</i>	Mejillones
Ostreidae	<i>Ostrea iridescens</i>	Ostras

Exhibit 1 Organization Chart
 Ministry of Environment and Natural Resources
 (in Spanish)

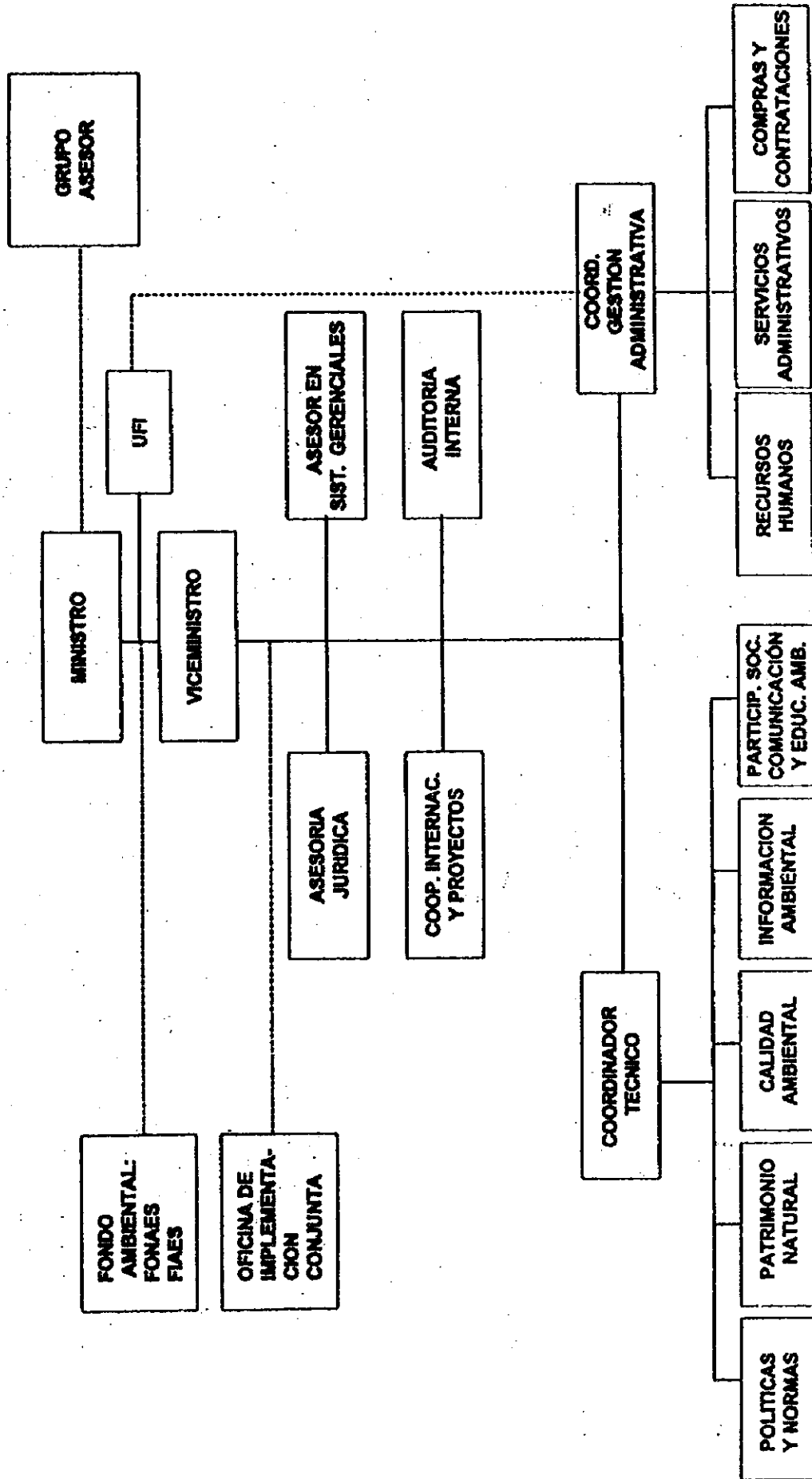


Exhibit 2 Municipalities of the Province of La Unión

Scale 1: 250,000

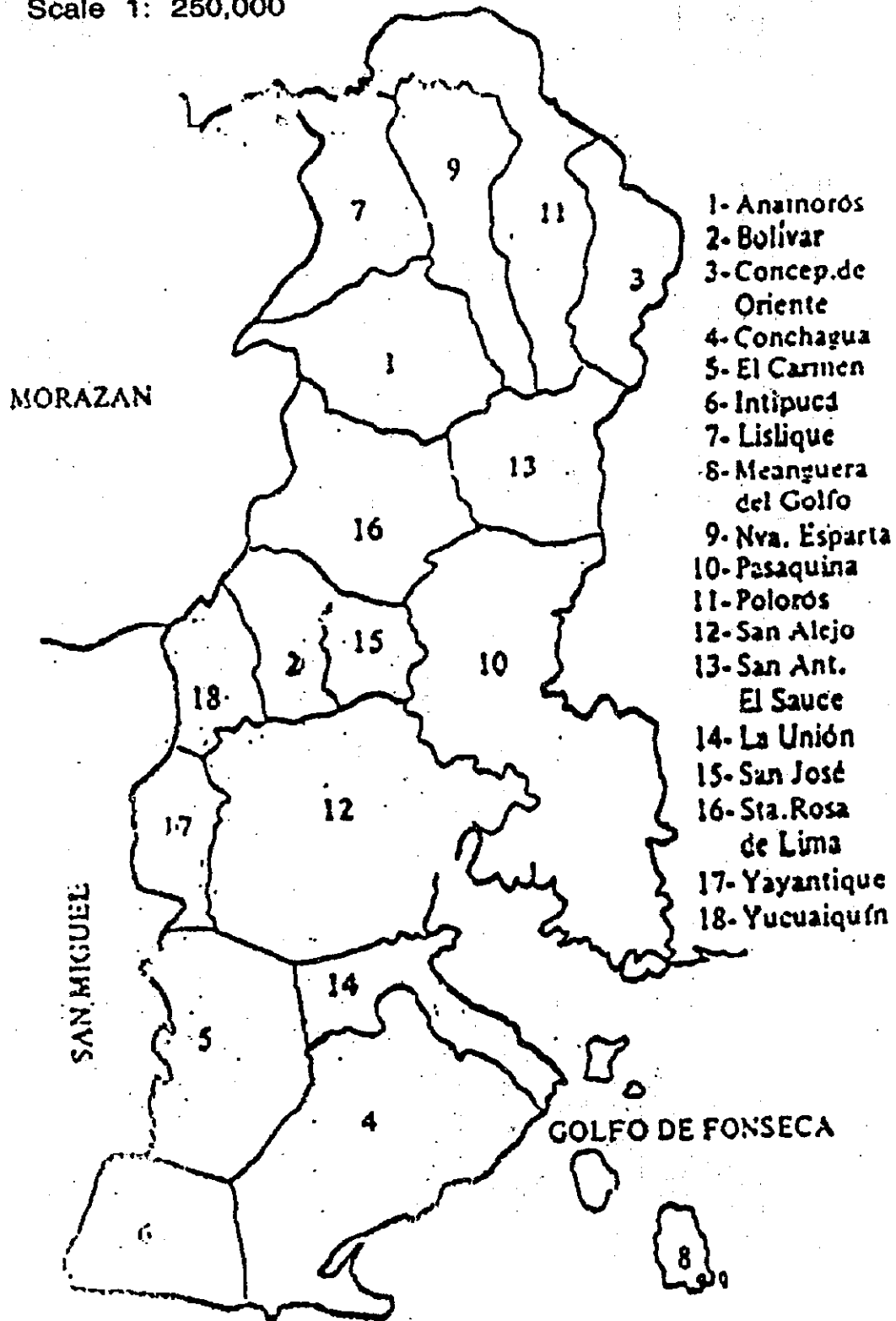


Exhibit 3 Photograph - Old Vessels in Process of Sinking



Exhibit 4 Photograph - Pollution by Old Vessels



Exhibit 5 Settlements in the Study Area

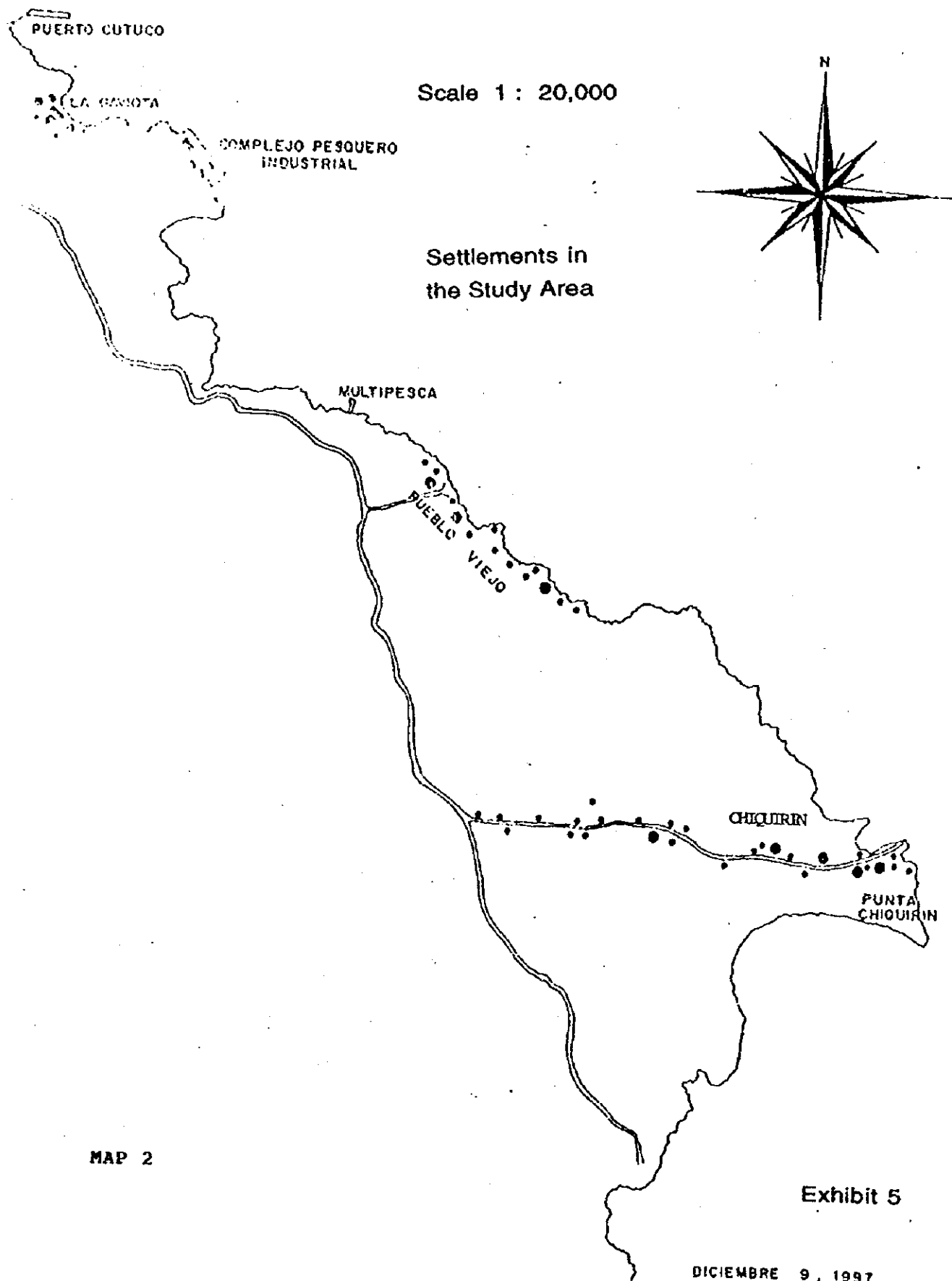
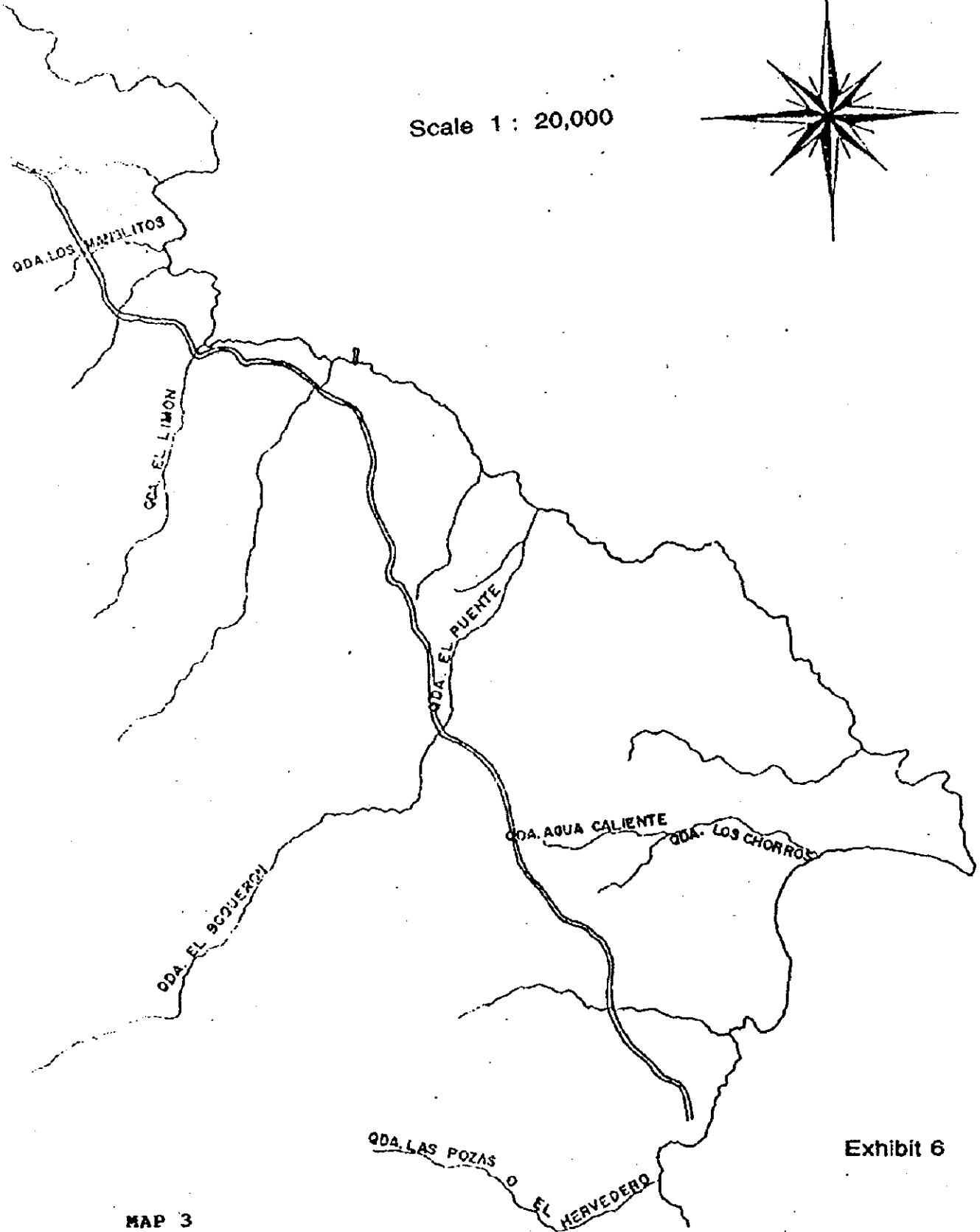
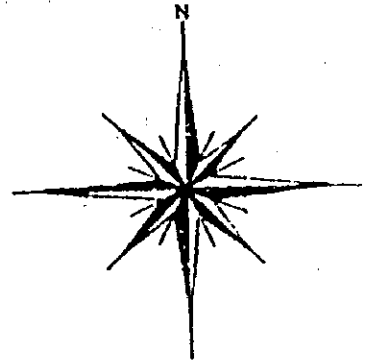


Exhibit 6 Hydrography in the Area of the Study

Scale 1 : 20,000



MAP 3

Exhibit 6

Exhibit 7 Photograph - Polluted Area



Reference List

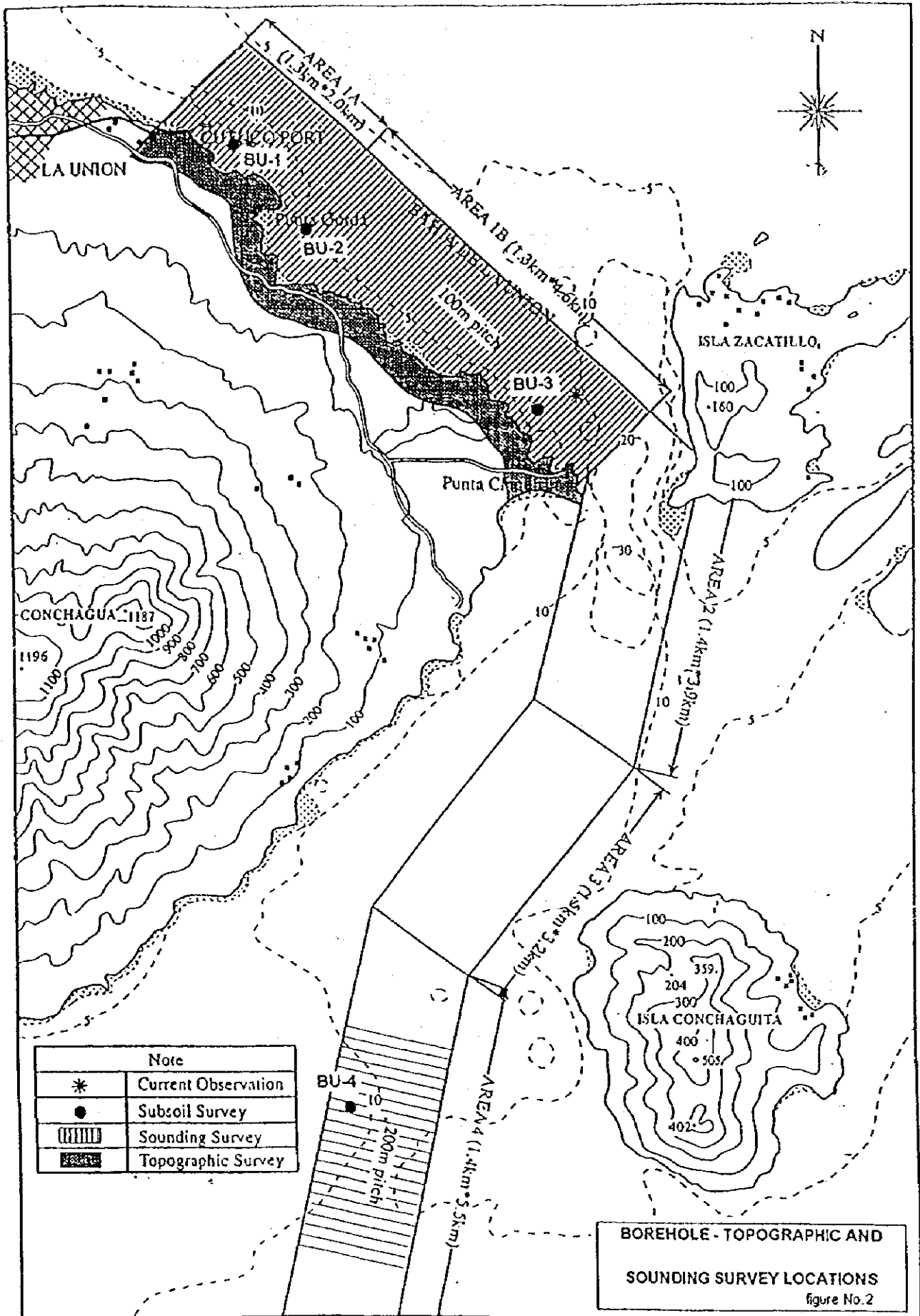
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APPENDIX 2

Appendix 2 Subsoil Survey



BOREHOLE - TOPOGRAPHIC AND
SOUNDING SURVEY LOCATIONS
figure No. 2

LOG OF BORING

SHEET No. 1/3

BORING No.: BU-1

LOCATION: GULF OF FONSECA	COORDINATES: N 87 49' 00" - E 13 19' 50"	DRILL RIG: LONGYEAR 34
THE STUDY FOR PORT REACTIVATION IN LA UNION PROVINCE, EL SALVADOR	SEA BOTTOM ELEVATION: -9.50 m	DRILLER: REGINALDO TELLO
	DATE STARTED-FINISHED: 4 - 5 / 12 / 97	LOGGED BY: RODOLFO ALVARADO V

DEPTH m	ELEVATION: m	MATERIAL TYPE	LOG	CLASSIFICATION OF MATERIAL	# SAMPLE	SAMPLE TYPE	RECOVERY %	SPT TEST					N			
								10	20	30	40	50		>50		
1		CLASTIC SHALLOW DEPOSITS	[Hatched]	Clay, light gray -brown, very soft, high plasticity and organic contents	SPT-1		100							1		
2																
3																
4						Clay, light gray, very soft, high plasticity	SPT-2		100							1
5	-14.50			5.00 - 5.60 m Shelby tube sample was not recovered												
6																
7																
8				idem	SPT-3		100							1		
9																
10	-19.50			dem	SPT-4		60							1		

LOG OF BORING

SHEET No. 2/3

BORING No.: BU-1

LOCATION: GULF OF FONSECA	COORDINATES: N 87 49' 00" - E 13 19' 50"	DRILL RIG: LONGYEAR 34
THE STUDY FOR PORT REACTIVATION IN LA UNION PROVINCE, EL SALVADOR	SEA BOTTON ELEVATION: -9.50 m	DRILLER: REGINALDO TELLO
	DATE STARTED-FINISHED: 4 - 5 / 12 / 97	LOGGED BY: RODOLFO ALVARADO V

DEPTH m	ELEVATION: m	MATERIAL TYPE	LOG	CLASSIFICATION OF MATERIAL	# SAMPLE	SAMPLE TYPE	RECOVERY %	SPT TEST						N	
								10	20	30	40	50	>50		
11		CLASTIC SHALLOW DEPOSITS	[Hatched pattern]	10.00 - 10.80 m Shelby Tube sample was not recovered											
12				Clay - silty clay, dark brown, soft, medium to high plasticity, with organic contents (wood pieces and shell fragments)	SPT-5	100									
13				idem	SPT-6	100									1
14															
15	-24.50														
16															
17				Clay, dark brown, very soft, high plasticity	SPT-7	100									1
18					SH-8	100									
19				Sandy silt, light gray, medium stiff, low to medium plasticity, fine sand and clay traces, with some organic contents (pieces of wood)	SPT-9	67									8
20	-29.50														

LOG OF BORING

BORING No.: BU-1

LOCATION: GULF OF FONSECA		COORDINATES: N 87 49' 00" - E 13 19' 50"		DRILL RIG: LONGYEAR 34												
THE STUDY FOR PORT REACTIVATION IN LA UNION PROVINCE, EL SALVADOR		SEA BOTTON ELEVATION: -9.50 m		DRILLER: REGINALDO TELLO												
		DATE STARTED-FINISHED: 4-5 / 12 / 67		LOGGED BY: RODOLFO ALVARADO V												
DEPTH m	ELEVATION: m	MATERIAL TYPE	LOG	CLASSIFICATION OF MATERIAL	# SAMPLE	SAMPLE TYPE	RECOVERY %	SPT TEST					N			
								10	20	30	40	50		>50		
21		CLASTIC SHALLOW DEPOSITS		Sand, dark brown, dense, medium to coarse grained, with traces of fine sand and gravel, some pieces of shells	SPT-10	▲	1								36	
22				Sand, brown-gray, medium dense, fine to medium grained, with pieces of volcanic rock up to 1 cm in size	SPT-11	▲	33									21
23				Clayey silt - silty clay, reddish, hard, high plasticity, with traces of coarse sand and fine gravel (volcanic rocks up to 0.75 cm in size)	SPT-12	▲	44									84
24				Idem, with medium sand	SPT-13	▲	44									62
25	-34.50			Sandy silt, brown to reddish brown, very stiff - hard, medium plasticity, with pieces of rock up to 1 cm in size	SPT-14	▲	44									24
26				Idem. With little sand and fine gravel	SPT-15	▲	56									40
27				Silty sand, brown, medium dense to dense, fine and medium grained	SPT-16	▲	33									36
28				Idem, dense, with pieces of volcanic rocks up to 1 cm in size	SPT-17	▲	56									45
29				Idem	SPT-18	▲	33									80
30	-39.70			Idem. Very dense, fine to medium grained, not rock fragments	SPT-19	▲	44									86
		Gravel and sand, pieces up to 2.5 cm in size	SPT-20	▲	25									>50		

END OF BORING AT 30.20 m

LOG OF BORING

SHEET No. 1/3

BORING No.: BU-2

LOCATION: GULF OF FONSECA	COORDINATES: N 87 48' 31" - E 13 19' 20"	DRILL RIG: LONGYEAR 34
THE STUDY FOR PORT REACTIVATION IN LA UNION PROVINCE, EL SALVADOR	SEA BOTTOM ELEVATION: -9.70 m	DRILLER: REGINALDO TELLO
	DATE STARTED-FINISHED: 8 - 10 / 12 / 97	LOGGED BY: RODOLFO ALVARADO V

DEPTH m	ELEVATION: m	MATERIAL TYPE.	LOG	CLASSIFICATION OF MATERIAL	# SAMPLE	SAMPLE TYPE	RECOVERY %	SPT TEST						N			
								10	20	30	40	50	>5				
1		CLASTIC SHALLOW DEPOSITS	[Hatched Area]	Clay, dark brown - gray, very soft, high plasticity very wet	SPT-1		100								1		
2																	
3				Idem. Dark gray color	SPT-2		.89										1
4				4.10 m. to 6.20 m. Shelby tube sample was not recovered													
5	-14.70																
6																	
7																	
8				Idem. Clay, dark gray, very soft, high plasticity, with shell fragments	SPT-3		100								1		
9																	
10	-19.70			Shelby tube sample, pressure 30 kg/cm2	SHT-4		100										

LOG OF BORING

SHEET No. 2/3

BORING No.: BU-2

LOCATION: GULF OF FONSECA	COORDINATES: N 87 48' 31" - E 13 19' 20"	DRILL RIG: LONGYEAR 34
THE STUDY FOR PORT REACTIVATION IN LA UNION PROVINCE, EL SALVADOR	SEA BOTTON ELEVATION: -9.70 m	DRILLER: REGINALDO TELLO
	DATE STARTED-FINISHED: 8 - 10 / 12 / 97	LOGGED BY: RODOLFO ALVARADO V

DEPTH m	ELEVATION: m	MATERIAL TYPE	LOG	CLASSIFICATION OF MATERIAL	# SAMPLE	SAMPLE TYPE	RECOVERY %	SPT TEST						N				
								10	20	30	40	50	>50					
11		CLASTIC SHALLOW DEPOSITS	[Hatched pattern]	Clay, dark gray, very soft, high plasticity	SHT-4													
							SPT-5		100									1
12																		
13						Idem.	SPT-6		100									1
14						14.00 m to 14.60 m. Shelby tube sample was not recovered												
15	-24.70																	
16						Idem.	SPT-7		100									1
17						Shelby tube sample, pressure = 30 kg/cm ²	SHT-8											
18						Clay, light gray, very soft to soft, high plasticity, with some organic contents (pieces of wood)	SPT-9		78									2
19						Silty clay, dark gray to black, very soft to soft, high plasticity, with pieces of wood	SPT-10		100									2
20	-29.70																	

LOG OF BORING

SHEET No. 3/3

BORING No.: BU-2

LOCATION: GULF OF FONSECA		COORDINATES: N 87 48' 31" - E 13 19' 20"		DRILL RIG: LONGYEAR 34												
THE STUDY FOR PORT REACTIVATION IN LA UNION PROVINCE, EL SALVADOR		SEA BOTTON ELEVATION: -9.70 m		DRILLER: REGINALDO TELLO												
		DATE STARTED-FINISHED: 8 - 10 / 12 /97		LOGGED BY: ROGOLFO ALVARADO V												
DEPTH m	ELEVATION: m	MATERIAL TYPE	LOG	CLASSIFICATION OF MATERIAL	# SAMPLE	RECOVERY %	SPT TEST N									
							10	20	30	40	50	>50				
21		CLASTIC SHALLOW DEPOSITS		Idem.	SPT-11	100								1		
22																
23																
24						Silty clay - clay, dark gray to black, very soft to soft, high plasticity, with organic contents	SPT-12	100								1
25	-34.70															
26						Idem.	SPT-13	100								1
27						Gravel and sand, pieces of volcanic rock up to 1cm in size (sand was not recovery)	SPT-14	15								56
28						Silty sand to fine sand, dark gray, very dense, with traces of medium sand	SPT-15	38								74
29						Idem.	SPT-16	63								>50
30	-39.75					Idem.	SPT-17	100								>50
				END OF BORING AT 30.20 m												

LOG OF BORING

SHEET No. 1/1

BORING No.: BU-3

LOCATION: GULF OF FONSECA	COORDINATES: N 13 17' 58" - E 87 47' 05"	DRILL RIG: LONGYEAR 34
THE STUDY FOR PORT REACTIVATION	SEA BOTTON ELEVATION: -8.20 m	DRILLER: REGINALDO TELLO
IN LA UNION PROVINCE, EL SALVADOR	DATE STARTED-FINISHED: 10/12/97	LOGGED BY: RODOLFO ALVARADO V

DEPTH m	ELEVATION: m	MATERIAL TYPE	LOG	CLASSIFICATION OF MATERIAL	# SAMPLE	SAMPLE TYPE	RECOVERY %	SPT TEST						N	
								10	20	30	40	50	>50		
1		CLASTIC SHALLOW DEPOSITS		Clay, brown - gray, very soft, high plasticity, very wet	SPT-1		100							1	
2															
3					Idem		SPT-2		100						
4															
5	-13.20														
6															
7				Clay, dark gray, very soft, high plasticity, with fine sand traces	SPT-3		100							1	
8				Sandy clay with pieces of rocks (up to 2cm in size), hard, high plasticity	SPT-4		22							42	
9				Idem	SPT-5		50							>50	
10	-18.20			END OF BORING AT 10.05 m	SPT-6		60							>50	

LOG OF BORING

SHEET No. 1/1

BORING No.: BU-4

LOCATION: GULF OF FONSECA	COORDINATES: N 87 49' 15" - E 13 13' 21"	DRILL RIG: LONGYEAR 34
THE STUDY FOR PORT REACTIVATION	SEA BOTTON ELEVATION: -9.30 m	DRILLER: REGINALDO TELLO
IN LA UNION PROVINCE, EL SALVADOR	DATE STARTED-FINISHED: 15 / 12 / 97	LOGGED BY: RODOLFO ALVARADO V

DEPTH m	ELEVATION: m	MATERIAL TYPE	LOG	CLASSIFICATION OF MATERIAL	# SAMPLE	SAMPLE TYPE	RECOVERY %	SPT TEST								
								10	20	30	40	50	>50			
1		CLASTIC SHALLOW DEPOSITS		Sandy silt - Silty sand, dark brown, fine grained, low plasticity, with organic contents (little pieces of wood)	sp1e-1											
2				Silty sand, dark brown, fine grained	sp1e-2											
3				Idem. With organic contents, pieces of wood and shell fragments	sp1e-3											
4				Silty sand - fine sand, gray, not plasticity	sp1e-4											
5	-14.30			Fine sand, brown - gray, with traces of silty sand	sp1e-5											
6		Fine sand, gray, no silty sand traces, with little pieces of shell fragments	sp1e-5													
7		Idem.	sp1e-6													
8		Idem.	sp1e-7													
8.50	-17.80	END OF BORING AT 8.50 m		sp1e-8												
9																
10																

APPENDIX 3

Appendix 3 Rough Cost Estimate

2005 (-12.0m)
2015 (-13.0m)
Comparative of Alternative Plan
Port of Cutuco

Unit : *¥1000,000

Plan	Short Term	Long Term	Total	Order
A-1	5,081	5,128	23,225	5
B-1	18,013	6,789	24,802	6
B-2	14,309	5,564	19,873	2
B-3	15,425	5,134	20,559	3
C-1	18,188	6,825	25,013	7
C-2	16,135	6,641	22,776	4
C-3	14,467	4,325	18,792	1

(Note) Exchange Rate: 1 US Dollar = 8.75 Colon = 130 Yen

Appendix 3 Rough Cost Estimate

2005 (-12.0m)
2015 (-13.0m)
Comparative of Alternative Plan
Port of Cutuco

Unit : *¥1000,000

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A-1	18,097	5,128	23,225	5
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C-3	14,467	4,325	18,792	1

(Note) Exchange Rate: 1 US Dollar = 8.75 Colon = 130 Yen

PLAN

A-1

Short Term-(12m) 2005

PORT OF CUTUCO
QUANTITY CALCULATION SHEET

Place	Category	Main Work Items	Detailed Work Items	Unit	Quantity	Unit Cost	Cost			
Mobilization	Mobilization	Mobilization	Mobilization	ls	1		1,194,035,819	(Short Term 2005)		
		Temporary Facilities		ls	1		119,603,583	11,960,358,190		
	(D)Sub Total						1,313,639,402			
Container	Dredging	Removal of Soft Soil		cu.m	53,100	520	27,812,000	1,619,682,000		
		Blasting Hard Rock		cu.m	159,225	10,800	1,715,250,000			
		Container Wharf	Foundation Rocks		cu.m	3,400	6,000		20,400,000	
			Displacement of Soil		cu.m	0	0		0	
		L=300 m	Concrete Caisson	Manufacture		cu.m	19,346		20,000	386,920,000
				Transportation		no	15		300,000	4,500,000
				Installation		no	15		100,000	1,500,000
				Sand Filling		cu.m	43,842		1,000	43,842,000
			Backfill Stone		cu.m	54,000	3,000		162,000,000	
			Crown Concrete		cu.m	3,236	17,000		55,012,000	
			Apron Concrete		cu.m	1,549	15,000		23,235,000	
			Grass Foundation of Land Side		cu.m	1,022	15,000		15,330,000	
			Installation of Fender		no	13	20,000,000		260,000,000	
			Installation of Mooring Bit		no	15	5,000,000		75,000,000	
		Land Reclamation	Land Reclamation		meter	509	20,000		10,180,000	1,105,922,000
			Equipment		cu.m	124,559	1,500		186,838,500	187,425,000
		Buildings	Buildings		cu.m	21,500	14,000		301,000,000	441,000,000
			Utilities		cu.m	1,500	20,000		30,000,000	30,000,000
			(D)Sub Total						3,593,419,450	3,552,419,450
		Multi Purpose (1)	Dredging	Removal of Soft Soil		cu.m	24,440		520	12,708,800
Blasting Hard Rock				cu.m	4,819	10,000	48,190,000			
East Revetment	Foundation Rocks				cu.m	23,115	8,000	184,920,000		
	Concrete Caisson			Manufacture		cu.m	2,989	20,300	60,675,000	
L=140 m				Transportation		no	17	150,000	2,550,000	
				Installation		no	17	50,000	850,000	
				Sand Filling		cu.m	8,591	1,000	8,591,000	
	Backfill Stone				cu.m	10,872	3,000	32,616,000		
Main Wharf	Foundation Rocks				cu.m	4,860	8,000	38,880,000	260,192,000	
	Displacement of Soil				cu.m	209,234	1,500	313,851,000		
L=280 m	Concrete Caisson			Manufacture		cu.m	11,596	20,000	231,920,000	
				Transportation		no	13	300,000	3,900,000	
				Installation		no	13	100,000	1,300,000	
				Sand Filling		cu.m	27,896	1,000	27,896,000	
	Backfill Stone				cu.m	46,830	5,000	234,150,000		
	Crown Concrete				cu.m	2,848	17,000	48,416,000		
	Apron Concrete				cu.m	1,357	17,000	23,069,000		
	Installation of Fender				no	13	20,000,000	260,000,000		
	Installation of Mooring Bit				no	13	5,000,000	65,000,000		
	Land Reclamation			Land Reclamation		cu.m	529,000	1,500	793,500,000	1,245,472,000
Equipment			cu.m	27,300	14,000	382,200,000	793,500,000			
Buildings	Buildings		cu.m	1,500	20,000	30,000,000	382,200,000			
	Utilities		ls	1		12,290,940	30,000,000			
	(D)Sub Total					2,909,173,440	2,939,173,440			
Channel	Dredging	Channel Dredging		cu.m	3,474,357	400	1,389,754,800	1,389,754,800		
		Lump Sum		cu.m	431,252	400	172,496,800	3,538,008,500		
		Bench Pocket		cu.m	954,320	3,450	3,285,511,300			
		Navigation Aids		no	18		270,000,000	270,000,000		
	(D)Sub Total					5,199,762,900				
Road	Access Road	Access Road		sq.m	27,000	10,000	270,000,000	270,000,000		
	(D)Sub Total					270,000,000	270,000,000			
	(D)Sub Total					13,275,995,371				
Engineering Fee				LS	1	1,527,599,531				
Contingency				LS	1	14,603,594,908				
Loadline Equip't				LS	1	1,460,359,481				
	Grand Total					2,937,460,000				
						18,987,414,799				

PORT OF CUTUCO
QUANTITY CALCULATION SHEET

Place	Category	Main Work Items	Detailed Work Items	Unit	Quantity	Unit Cost	Cost	Unit Cost		
Mobilization	Mobilization	Mobilization		ts	1		140,775,880	(Short Term 2005)		
		Temporary Facilities		ts	1		14,077,588	1,407,758,900		
	(1)Sub Total						154,853,468			
Container	Container Wharf L=300 m	Dredging	Removal of Soft Soil	cum	0	520	0	0		
			Steering Hard Rock	cum	0	10,000	0	0		
			Foundation Rocks	cum	0	8,000	0	0		
			Displacement of Soil	cum	0	0	0	0		
			Concrete Caisson	Manufacture	cum	0	20,000	0	0	
				Transportation	no	0	300,000	0	0	
				Installation	no	0	100,000	0	0	
				Sand Filling	cum	0	1,000	0	0	
				Backfilling Stone	cum	0	5,000	0	0	
				Crown Concrete	cum	0	17,000	0	0	
				Apron Concrete	cum	0	17,000	0	0	
				Crane Foundation of Land Side	cum	0	18,000	0	0	
				Installation of Fender	no	0	20,000,000	0	0	
				Installation of Mooring Bit	no	0	5,000,000	0	0	
				Laying Rail	meter	0	20,000	0	0	
			Land Reclamation	Land Reclamation	cum	0	1,500	0	0	
			Pavement	Pavement	cum	0	14,000	0	0	
			Building	Building	sq.m	0	20,000	0	0	
			Utilities	Utilities	ts	0	0	0	0	
			(2)Sub Total						0	
Multi Purpose (1)	East Revetment L=140 m	Dredging	Removal of Soft Soil	cum	0	520	0	0		
			Steering Hard Rock	cum	0	10,000	0	0		
			Foundation Rocks	cum	0	8,000	0	0		
			Concrete Caisson	Manufacture	cum	0	20,000	0	0	
				Transportation	no	0	150,000	0	0	
				Installation	no	0	50,000	0	0	
				Sand Filling	cum	0	1,000	0	0	
				Backfill Stone	cum	0	5,000	0	0	
				Foundation Rocks	cum	0	8,000	0	0	
				Displacement of Soil	cum	0	1,500	0	0	
				Concrete Caisson	Manufacture	cum	0	20,000	0	0
				Transportation	no	0	300,000	0	0	
				Installation	no	0	100,000	0	0	
				Sand Filling	cum	0	1,000	0	0	
				Backfill Stone	cum	0	5,000	0	0	
				Crown Concrete	cum	0	17,000	0	0	
				Apron Concrete	cum	0	17,000	0	0	
				Installation of Fender	no	0	20,000,000	0	0	
				Installation of Mooring Bit	no	0	5,000,000	0	0	
			Land Reclamation	Land Reclamation	cum	0	1,500	0	0	
	Pavement	Pavement	cum	0	14,000	0	0			
	Building	Building	sq.m	0	20,000	0	0			
	Utilities	Utilities	ts	0	0	0	0			
	(2)Sub Total						0			
Channel	Channel	Dredging	Channel Dredging	cum	1,135,580	400	462,232,000	482,232,000		
			Turning Basin	cum	336,437	400	134,574,800	675,524,800		
			Bath Pocket	cum	155,000	3,490	540,550,000			
			Navigation Aids	no	0	0	270,000,000	270,000,000		
	(3)Sub Total					1,407,758,800				
Road	Access Road	Access Road	Access Road	sq.m	0	10,000	0	0		
		(3)Sub Total					0	2,815,513,600		
Engineering Fee	(1)-(5) Total			L.S	1		1,582,510,048			
				L.S	1		156,281,028			
Contingency	Total			L.S	1		1,738,791,076			
				L.S	0		171,887,105			
Lowline Equip't	Grand Total			L.S	0		0			
				L.S	1		1,890,758,158	2,410,453,290		
Mobilization	Mobilization	Mobilization	Mobilization	L.S	1		241,645,329	2,410,453,290		
			Temporary Facilities	L.S	1		24,104,532			
	(1)Sub Total			L.S	1		265,749,862			
Multi Purpose (2)	Main Wharf (2)	Dredging	Removal of Soft Soil	cum	24,440	520	39,248,800			
			Steering Hard Rock	cum	4,816	10,000	48,100,000			
			Foundation Rocks	cum	4,880	8,000	39,040,000			
			Concrete Caisson	Manufacture	cum	11,568	20,000	231,360,000		
				Transportation	no	13	300,000	3,900,000		
				Installation	no	13	1,000,000	13,000,000		
				Sand Filling	cum	37,999	1,000	37,999,000		
				Backfill Stone	cum	48,400	5,000	242,000,000		
				Crown Concrete	cum	2,848	17,000	48,416,000		
				Apron Concrete	cum	1,357	17,000	23,069,000		
				Installation of Fender	no	13	20,000,000	260,000,000		
				Installation of Mooring Bit	no	13	5,000,000	65,000,000		
			Land Reclamation	Land Reclamation	cum	375,000	1,500	562,500,000		
			Pavement	Pavement	sq.m	27,300	14,000	382,200,000		
			Building	Building	sq.m	1,500	20,000	30,000,000		
			Utilities	Utilities	L.S	1		314,793,490	2,295,869,800	
			(2) Sub Total					2,410,453,290	2,410,453,290	
			Total			L.S	1		2,675,303,152	
		Engineering Fee	Total			L.S	1		267,580,313	
						L.S	1		2,942,883,465	
Contingency	Grand Total			L.S	1		294,318,347			
				L.S	1		3,237,178,814	5,128,207,972		

PLAN (12m-13m)
 B-1 Short Term (12m) 2005

PORT OF GUTUO
 QUANTITY CALCULATION SHEET

Place	Category	Main Work	Detailed Item	Unit	Quantity	Unit Cost	Cost		
Mobilization	Mobilization	Mobilization		ts			1,139,217,114		
		Temporary Facilities		ts			118,972,711		
	(1) Sub Total						1,308,899,823		
Container	Dredging	Removal of Soft Soil		cu.m	914,400	520	475,332,000		
		Foundation Rocks		cu.m	13,664	4,000	54,656,000		
		Concrete Caisson	Manufacture	cu.m	1,390	20,000	27,800,000		
		ditto	Transportation	no	10	150,000	1,500,000		
		ditto	Installation	no	10	50,000	500,000		
		ditto	Sand Filling	cu.m	3,183	1,000	3,183,000		
		Crown Concrete		cu.m	96	17,000	1,632,000		
		Backfilling Stone	Backfilling Stone	cu.m	8,192	3,000	24,576,000		
		Container Wharf	Foundation Rocks		cu.m	114,000	8,000	912,000,000	
			Displacement of Soil		cu.m	214,900	1,500	322,350,000	
	Concrete Caisson		Manufacture	cu.m	13,248	20,000	264,960,000		
	ditto		Transportation	no	15	300,000	4,500,000		
	ditto		Installation	no	15	100,000	1,500,000		
	ditto		Sand Filling	cu.m	43,842	1,000	43,842,000		
	Backfilling Stone			cu.m	51,920	3,000	155,760,000		
	Crown Concrete			cu.m	3,268	17,000	55,536,000		
	Apron Concrete			cu.m	1,586	18,000	28,548,000		
	Crane Foundation of Land Side			cu.m	1,002	18,000	18,036,000		
	Land Reclamation	Installation of Fender		no	15	20,000,000	300,000,000		
		Installation of Mooring Bit		no	15	5,000,000	75,000,000		
		Laying Rail		meter	550	20,000	11,000,000		
		Land Reclamation	Land Reclamation	cu.m	1,042,850	1,500	1,564,275,000		
		Pavement	Pavement	cu.m	31,500	14,000	441,000,000		
		Building	Building	sq.m	1,500	20,000	30,000,000		
		Utilities	Utilities	ts	1		236,152,850		
		(12) Sub Total						4,963,600,350	
		Multi Purpose (1)	Dredging	Removal of Soft Soil		cu.m	962,840	520	500,172,800
				Foundation Rocks		cu.m	0	8,000	0
	Concrete Caisson			Manufacture	cu.m	0	20,000	0	
	ditto			Transportation	no	0	150,000	0	
	ditto			Installation	no	0	50,000	0	
	Main Wharf		ditto	Sand Filling	cu.m	0	1,000	0	
			Backfill Stone		cu.m	0	3,000	0	
Foundation Rocks				cu.m	88,800	8,000	710,400,000		
Displacement of Soil				cu.m	185,900	1,500	278,850,000		
Concrete Caisson			Manufacture	cu.m	11,568	20,000	231,360,000		
ditto			Transportation	no	13	300,000	3,900,000		
ditto			Installation	no	13	100,000	1,300,000		
ditto			Sand Filling	cu.m	31,996	1,000	31,996,000		
Backfill Stone				cu.m	45,058	3,000	135,174,000		
Crown Concrete				cu.m	2,846	17,000	48,382,000		
Land Reclamation	Apron Concrete			cu.m	1,351	17,000	22,967,000		
	Installation of Mooring Bit			no	15	20,000,000	300,000,000		
	Land Reclamation		Land Reclamation	cu.m	1,104,000	1,500	1,656,000,000		
	Pavement		Pavement	cu.m	21,300	14,000	298,200,000		
	Building		Building	sq.m	1,500	20,000	30,000,000		
(13) Sub Total						4,408,171,490			
Channel	Dredging	Channel Dredging		cu.m	3,392,801	400	1,357,120,400		
	Dredging	Turning Berth Pocket		cu.m	1,729,148	400	691,659,200		
	Navigation Aids	Navigation Aids		no	18		270,000,000		
(14) Sub Total						2,317,459,600			
Road	Access Road	Access Road		sq.m	21,000	10,000	210,000,000		
(15) Sub Total						210,000,000			
(1) (15) Total						13,208,970,855			
Engineering Fee				ts	1		1,320,527,692		
Total							14,529,498,547		
Contingency				ts	1		1,452,556,826		
Loading Equip't				ts	1		2,023,490,000		
Grand Total							18,012,565,373		

(Short Term 2005)
 11,897,271,140
 147,553,000 Revet
 2,089,222,000 Wharf
 4,727,448,000 4,583,800,850
 0
 1,787,981,000 Main
 4,198,353,800 4,408,171,490
 11,897,271,140

PLAN (-12m ~ -13m)
B-1 Long Term (-13m) 2015

PORT OF CUTUCO
QUANTITY CALCULATION SHEET

Phase	Category	Main Work	Detail Item	Unit	Quantity	Unit Cost	Cost
Mobilization	Mobilization	Mobilization		LS	1		440,717,219
		Temporary Facilities		LS	1		44,071,722
	(1) Sub Total						484,788,941
Container	Dredging	Removal of Soft Soil		cu.m	0	520	0
	Wet Revetment	Foundation Rocks		cu.m	0	8,000	0
	L=80 m	Concrete Caisson	Manufacture	cu.m	0	20,000	0
			Transportation	no	0	150,000	0
			Installation	no	0	30,000	0
			ditto			1,000	0
			Sand Filling	cu.m	0	17,000	0
			Green Concrete	cu.m	0	5,000	0
			Backfilling Stone	cu.m	0	3,000	0
	Container Wharf	Foundation Rocks		cu.m	0	8,000	0
	L=300 m	Displacement of Soil		cu.m	0	1,500	0
		Concrete Caisson	Manufacture	cu.m	0	20,000	0
			Transportation	no	0	300,000	0
			Installation	no	0	100,000	0
			ditto			1,000	0
			Sand Filling	cu.m	0	1,000	0
			Backfilling Stone	cu.m	0	5,000	0
			Green Concrete	cu.m	0	17,000	0
			Armed Concrete	cu.m	0	17,000	0
			Grand Foundation of Land Side	cu.m	0	18,000	0
			Installation of Fender	no	0	20,000,000	0
			Installation of Mooring Bit	no	0	5,000,000	0
			Leaving Bit	meter	0	20,000	0
	Land Reclamation	Land Reclamation		cu.m	0	1,500	0
	Pavement	Pavement		sq.m	0	14,000	0
	Building	Building		sq.m	0	20,000	0
	Utilities	Utilities		LS	0	0	0
	(2) Sub Total						0
Multi Purpose (1)	Dredging	Removal of Soft Soil		cu.m	0	520	0
	Wet Revetment	Foundation Rocks		cu.m	0	8,000	0
	L=0 m	Concrete Caisson	Manufacture	cu.m	0	20,000	0
			Transportation	no	0	150,000	0
			Installation	no	0	30,000	0
			ditto			1,000	0
			Backfill Stone	cu.m	0	5,000	0
	Main Wharf	Foundation Rocks		cu.m	0	8,000	0
	L=280 m	Displacement of Soil		cu.m	0	1,500	0
		Concrete Caisson	Manufacture	cu.m	0	20,000	0
			Transportation	no	0	300,000	0
			Installation	no	0	100,000	0
			ditto			1,000	0
			Sand Filling	cu.m	0	1,000	0
			Backfill Stone	cu.m	0	5,000	0
			Green Concrete	cu.m	0	17,000	0
			Armed Concrete	cu.m	0	17,000	0
			Installation of Fender	no	0	20,000,000	0
			Installation of Mooring Bit	no	0	5,000,000	0
			Leaving Bit	meter	0	20,000	0
	Land Reclamation	Land Reclamation		cu.m	0	1,500	0
	Pavement	Pavement		sq.m	0	14,000	0
	Building	Building		sq.m	0	20,000	0
	Utilities	Utilities		LS	0	0	0
	(3) Sub Total						0
Channel	Dredging	Channel Dredging		cu.m	1,155,586	400	462,232,000
	Dredging	Furnish Berth Pocket		cu.m	463,586	400	185,434,400
	Navigation Aids	Navigation Aids		no	0	0	0
	(4) Sub Total						647,666,400
Road	Access Road	Access Road		sq.m	0	10,000	0
	(5) Sub Total						0
Engineering Fee	Total			LS	1		718,900,724
Contingency	Total			LS	1		31,692,232
	Grand Total						750,592,956
							79,280,067
							671,312,889
Mobilization	Mobilization	Mobilization		LS	1		440,717,219
		Temporary Facilities		LS	1		44,071,722
	(1) Sub Total						484,788,941
Multi Purpose (2)	Dredging	Removal of Soft Soil		cu.m	790,140	520	410,872,800
	Wet Revetment	Foundation Rocks		cu.m	20,000	8,000	160,000,000
	L=300 m	Concrete Caisson	Manufacture	cu.m	5,790	20,000	115,800,000
			Transportation	no	37	150,000	5,550,000
			Installation	no	37	50,000	1,850,000
			ditto			1,000	14,350,000
			Sand Filling	cu.m	14,350	1,000	14,350,000
			Green Concrete	cu.m	300	17,000	5,100,000
			Backfill Stone	cu.m	24,700	5,000	123,500,000
	Main Wharf	Foundation Rocks		cu.m	96,800	8,000	774,400,000
	L=280 m	Displacement of Soil		cu.m	185,200	1,500	277,800,000
		Concrete Caisson	Manufacture	cu.m	11,590	20,000	231,800,000
			Transportation	no	13	200,000	2,600,000
			Installation	no	13	100,000	1,300,000
			ditto			1,000	11,994,000
			Sand Filling	cu.m	31,990	1,000	31,990,000
			Backfill Stone	cu.m	45,054	5,000	225,270,000
			Green Concrete	cu.m	1,648	17,000	28,016,000
			Armed Concrete	cu.m	1,357	17,000	23,069,000
			Installation of Fender	no	13	20,000,000	260,000,000
			Installation of Mooring Bit	no	13	5,000,000	65,000,000
			Leaving Bit	meter	0	1,500	1,122,915,000
	Land Reclamation	Land Reclamation		cu.m	148,550	1,500	222,825,000
	Pavement	Pavement		sq.m	27,300	14,000	382,200,000
	Building	Building		sq.m	1,500	20,000	30,000,000
	Utilities	Utilities		LS	1	0	209,495,296
	(2) Sub Total						4,407,173,190
Dredging	Berth Pocket			cu.m	0	400	0
	(3) Sub Total						0
	(1) (3) Total						4,407,173,190
Engineering Fee	Total			LS	1		4,801,992,241
Contingency	Total			LS	1		483,195,234
	Grand Total						5,285,187,475
							538,115,849
							5,823,303,324
Loading Equip				LS	1		0
							6,789,155,053

(Short Term 2005)
647,666,400

0 Revet

0 Wharf

0 0

0

0 Multi

0 0

647,666,400

(Long Term 2015)
4,407,173,190

483,279,000 Revet

1,761,981,000 Multi

4,187,307,800

4,191,307,800

4,407,173,190

PLAN (-12m-13m)
B-2 Short Form (-12m) 2005

PORT OF CUTUCO
QUANTITY CALCULATION SHEET

Place	Category	Main Work	Detailed Item	Unit	Quantity	Unit Cost	Cost		
Mobilization	Mobilization	Mobilization		L.S	1		913,942.185	(Short Form 2005)	
		Temporary Facilities		L.S	1		91,294.180	8,139,427.950	
	Sub Total						1,005,236.365		
Container	Dredging	Removal of Soft Soil		cum	481,000	520	251,180,000		
		Foundation Rocks		cum	7,020	8,000	42,120,000		
	West Revetment	Concrete Caisson	Manufacture	cum	2,128	20,000	43,860,000		
			Transportation	no	15	150,000	2,250,000		
			Installation	no	15	30,000	450,000		
			Sand Filling	cum	4,645	1,000	4,645,000		
			Crown Concrete	cum	144	17,000	2,448,000		
			Backfilling Stone	cum	8,420	5,000	32,100,000	126,273,000	
			Foundation Rocks	cum	21,800	8,000	170,800,000	126,273,000	
			Displacement of Soil	cum	25,200	1,500	37,800,000		
	L=300 m	Concrete Caisson	Manufacture	cum	13,348	20,000	266,880,000		
			Transportation	no	15	300,000	4,500,000		
			Installation	no	15	100,000	1,500,000		
			Sand Filling	cum	43,842	1,000	43,842,000		
			Backfilling Stone	cum	51,990	5,000	259,950,000		
			Crown Concrete	cum	3,288	17,000	55,896,000		
			Apron Concrete	cum	1,588	17,000	26,996,000		
			Grass Foundation of Land Side	cum	1,092	18,000	19,656,000		
			Installation of Fender	no	15	20,000,000	300,000,000		
			Installation of Mooring Br	no	15	3,000,000	45,000,000		
			Laying Rail	meter	580	20,000	11,200,000	1,230,872,000	
	Land Reclamation	Land Reclamation		cum	487,700	1,500	731,550,000		
	Pavement	Pavement		cum	31,360	14,000	441,000,000		
	Building	Building		cum	1,500	20,000	30,000,000		
	Utilities	Utilities		lg	1		139,147,150	2,782,855,000	
	(2)Sub Total						2,821,991,750	2,542,564,750	
Multi Purpose (1)	Dredging	Removal of Soft Soil		cum	640,000	520	339,200,000		
		Foundation Rocks		cum	0	8,000	0		
		Concrete Caisson	Manufacture	cum	0	20,000	0		
			Transportation	no	0	150,000	0		
			Installation	no	0	30,000	0		
			Sand Filling	cum	0	1,000	0		
			Backfill Stone	cum	0	5,000	0		
			Foundation Rocks	cum	70,720	8,000	424,220,000	0	
			Displacement of Soil	cum	174,080	1,500	258,820,000		
			Concrete Caisson	Manufacture	cum	11,568	20,000	231,360,000	
			Transportation	no	13	300,000	3,900,000		
			Installation	no	13	100,000	1,300,000		
			Sand Filling	cum	37,998	1,000	37,998,000		
			Backfill Stone	cum	45,058	5,000	225,290,000		
			Crown Concrete	cum	2,548	17,000	48,418,000		
			Apron Concrete	cum	1,357	17,000	23,069,000		
			Installation of Fender	no	13	20,000,000	260,000,000		
			Installation of Mooring Br	no	15	3,000,000	45,000,000		
			Laying Rail	meter	800,750	1,500	966,825,000	1,577,271,000	
	Land Reclamation	Land Reclamation		cum	800,750	1,500	966,825,000		
	Pavement	Pavement		cum	37,300	14,000	522,200,000	9,042,358,500	
	Building	Building		cum	1,500	20,000	30,000,000	3,228,364,000	
	Utilities	Utilities		lg	1		161,418,200	3,054,514,200	
	(2)Sub Total						3,389,782,200		
Channel	Dredging	Channel Dredging		cum	3,495,184	400	1,394,056,800		
		Turning & Berth Pockets		cum	2,438,856	400	999,582,400		
		Navigation Aids		no	18		230,000,000		
	(2)Sub Total						2,663,648,000		
Road	Access Road	Access Road		cum	18,400	10,000	184,000,000		
	(2)Sub Total						184,000,000		
Engineering Fee	(1) (5) Total			L.S	1		10,144,788,025		
	Total			L.S	1		1,014,478,522		
Contingency				L.S	1		11,159,241,527		
Loadin Equip				L.S	1		1,115,924,133		
	Grand Total			L.S	1		2,033,491,000		
							14,308,823,680		

PLAN (-12m~13m)

B-2 Long Term(-13m) 2015

PORT OF CUTUGO
QUANTITY CALCULATION SHEET

Place	Category	Main Work	Detailed Item	Unit	Quantity	Unit Cost	Cost	Unit Cost		
Mobilization	Mobilization	Mobilization		L.S	1		58,858,880	(Short Term 2005)		
		Temporary Facilities		L.S	1		8,682,988	606,598,800		
(1)Sub Total							67,541,868			
Container	Dredging	Removal of Soft Soil		cu.m	0	520	0			
		West Revetment	Foundation Rocks		cu.m	0	8,000	0		
			Concrete Caisson	Manufacture	cu.m	0	20,000	0		
		L=150 m	ditto	Transportation	no	0	150,000	0		
			ditto	Installation	no	0	50,000	0		
			ditto	Sand Filling	cu.m	0	1,000	0		
			ditto	Crown Concrete	cu.m	0	17,000	0		
			ditto	Backfill Stone	Backfilling Stone	cu.m	0	5,000	0	
			ditto	Foundation Rocks		cu.m	0	8,000	0	
		Container Wharf	L=300 m	Displacement of Soil		cu.m	0	1,500	0	
				Concrete Caisson	Manufacture	cu.m	0	20,000	0	
			ditto	Transportation	no	0	200,000	0		
	ditto		Installation	no	0	100,000	0			
	ditto		Sand Filling	cu.m	0	1,000	0			
	ditto		Backfilling Stone		cu.m	0	5,000	0		
	ditto		Crown Concrete		cu.m	0	17,000	0		
	ditto		Apron Concrete		cu.m	0	17,000	0		
	ditto		Crane Foundation of Land Side		cu.m	0	18,000	0		
	ditto		Installation of Fender		no	0	20,000,000	0		
	Land Reclamation	Land Reclamation		cu.m	0	5,000,000	0			
		Laying Reel		meter	0	20,000	0			
	Pavement	Pavement		cu.m	0	14,000	0			
	Building	Building		sq.m	0	20,000	0			
	Utilities	Utilities		ts	1		0			
(2)Sub Total							0			
Multi Purpose (1)	Dredging	Removal of Soft Soil		cu.m	0	520	0			
		East Revetment	Foundation Rocks		cu.m	0	8,000	0		
			Concrete Caisson	Manufacture	cu.m	0	20,000	0		
		L=0	ditto	Transportation	no	0	150,000	0		
			ditto	Installation	no	0	50,000	0		
			ditto	Sand Filling	cu.m	0	1,000	0		
			ditto	Backfill Stone		cu.m	0	5,000	0	
			Main Wharf	Foundation Rocks		cu.m	0	8,000	0	
				Displacement of Soil		cu.m	0	1,500	0	
		L=260 m	Concrete Caisson	Manufacture	cu.m	0	20,000	0		
			ditto	Transportation	no	0	300,000	0		
			ditto	Installation	no	0	100,000	0		
	ditto		Sand Filling	cu.m	0	1,000	0			
	ditto		Backfill Stone		cu.m	0	5,000	0		
	ditto		Crown Concrete		cu.m	0	17,000	0		
	ditto		Apron Concrete		cu.m	0	17,000	0		
	ditto		Installation of Fender		no	0	2,000,000	0		
	ditto		Installation of Mooring Bit		no	0	5,000,000	0		
	ditto		Land Reclamation		cu.m	0	1,500	0		
	Land Reclamation	Land Reclamation		cu.m	0	1,500	0			
		Pavement	Pavement	cu.m	0	14,000	0			
	Building	Building		sq.m	0	20,000	0			
	Utilities	Utilities		ts	1		0			
	(3)Sub Total							0		
Channel	Dredging	Channel Dredging		cu.m	1,155,595	400	462,232,000			
	Dredging	Turning & Berth Pocket		cu.m	518,913	400	207,565,200			
	Navigation Aids			no	0		0			
(4)Sub Total							669,797,200			
Road	Access Road	Access Road		sq.m	0	10,000	0			
	(5)Sub Total							0		
(1)(3) Total							742,144,868			
Engineering Fee				L.S	1		74,214,487			
Total							816,359,355			
Contingency				L.S	1		81,635,933			
Grand Total							897,995,288			
Mobilization	Mobilization	Mobilization		L.S	1		143,384,100	(Long Term 2015)		
		Temporary Facilities		L.S	1		34,738,410	3,473,841,000		
(1)(5)Sub Total							178,122,510			
Multi Purpose (2)	Dredging	Removal of Soft Soil		cu.m	727,300	520	378,195,000			
		East Revetment	Foundation Rocks		cu.m	33,120	8,000	264,960,000		
			Concrete Caisson	Manufacture	cu.m	4,854	20,000	97,080,000		
		L=240 m	ditto	Transportation	no	30	150,000	4,500,000		
			ditto	Installation	no	30	50,000	1,500,000		
			ditto	Sand Filling	cu.m	11,542	1,000	11,542,000		
			ditto	Crown Concrete		cu.m	288	17,000	4,896,000	
			ditto	Backfill Stone		cu.m	18,808	5,000	94,040,000	
			Main Wharf	L=280 m	Foundation Rocks		cu.m	70,720	8,000	565,760,000
		Displacement of Soil				cu.m	171,060	1,500	256,590,000	
		Concrete Caisson		Manufacture	cu.m	11,598	20,000	231,960,000		
		ditto		Transportation	no	13	200,000	2,600,000		
	ditto	Installation		no	13	100,000	1,300,000			
	ditto	Sand Filling		cu.m	37,895	1,000	37,895,000			
	ditto	Backfill Stone			cu.m	45,058	5,000	225,290,000		
	ditto	Crown Concrete			cu.m	2,848	17,000	48,416,000		
	ditto	Apron Concrete			cu.m	1,357	17,000	23,069,000		
	ditto	Installation of Fender			no	13	20,000,000	260,000,000		
	ditto	Installation of Mooring Bit		no	13	5,000,000	65,000,000			
	Land Reclamation	Land Reclamation		cu.m	382,290	1,500	573,435,000			
		Pavement	Pavement	sq.m	27,300	14,000	382,200,000			
	Building	Building		sq.m	1,500	20,000	30,000,000			
	Utilities	Utilities		ts	1		155,421,000			
	(2)Sub Total							3,473,841,000		
Dredging		Berth Pocket		cu.m	0	400	0			
(3)Sub Total							0			
(1)(3) Total							3,855,282,510			
Engineering Fee				L.S	1		385,528,251			
Total							4,241,598,831			
Contingency				L.S	1		424,159,888			
Grand Total							4,665,758,719			
Leading Equip.		Installation of Gantry Crane		L.S	0		0			
Total							5,565,710,835			

PLAN (-12m²-13m)
B-3 Short Term-12m) 2005

PORT OF CUTUGO
QUANTITY CALCULATION SHEET

Place	Category	Main Work	Detailed Item	Unit	Quantity	Unit Cost	Cost	Unit #	
Mobilization	Mobilization	Mobilization		ts	1		997,025,317	(Short Term 2006)	
		Temporary Facilities		ts	1		99,702,592	9,970,259,185	
	(1)Sub Total						1,096,728,508		
Container	Dredging West Revetment L=350 m	Removal of Soft Soil		cu.m	768,540	520	399,640,800		
		Foundation Rocks		cu.m	28,270	4,000	113,080,000		
		Concrete Caisson	Manufacture	cu.m	4,791	20,000	95,820,000		
		ditto	Transportation	no	33	150,000	4,950,000		
		ditto	Installation	no	33	50,000	1,650,000		
		ditto	Sand Filling	cu.m	10,303	1,000	10,303,000		
		Crown Concrete		cu.m	312	17,000	5,304,000		
		Backfilling Stone	Backfilling Stone	cu.m	18,962	3,000	56,886,000	418,457,000	
		Foundation Rocks		cu.m	21,800	8,000	174,400,000		
		Displacement of Soil		cu.m	158,890	1,500	238,335,000		
	Container Wharf L=300 m	Concrete Caisson	Manufacture	cu.m	13,344	20,000	266,880,000		
		ditto	Transportation	no	15	300,000	4,500,000		
		ditto	Installation	no	15	100,000	1,500,000		
		ditto	Sand Filling	cu.m	43,842	1,000	43,842,000		
		Backfilling Stone		cu.m	51,990	5,000	259,950,000		
		Crown Concrete		cu.m	3,286	17,000	55,862,000		
		Apron Concrete		cu.m	1,586	17,000	26,962,000		
		Crown Foundation of Land Side		cu.m	1,002	18,000	18,036,000		
		Installation of Fender		no	15	20,000,000	300,000,000		
		Installation of Mooring Bit		no	15	5,000,000	75,000,000		
	Land Reclamation	Land Reclamation		meter	560	20,000	11,200,000	1,428,107,000	
		Land Reclamation		cu.m	587,025	1,500	880,537,500	1,428,107,000	
	Pavement	Pavement		cu.m	31,500	14,000	441,000,000		
Building	Building		sq.m	1,500	20,000	30,000,000			
Utilities	Utilities		ts	1		209,887,115	4,197,742,300		
	(2)Sub Total					4,407,829,415			
Multi Purpose(1)	Dredging East Revetment L=0 m	Removal of Soft Soil		cu.m	719,800	520	374,292,000		
		Foundation Rocks		cu.m	0	6,000	0		
		Concrete Caisson	Manufacture	cu.m	0	20,000	0		
		ditto	Transportation	no	0	150,000	0		
		ditto	Installation	no	0	50,000	0		
		ditto	Sand Filling	cu.m	0	1,000	0		
		Backfill Stone		cu.m	0	5,000	0		
		Main Wharf L=280 m	Foundation Rocks		cu.m	18,720	8,000	150,000,000	
			Displacement of Soil		cu.m	208,234	1,500	312,351,000	
			Concrete Caisson	Manufacture	cu.m	11,598	20,000	231,960,000	
	ditto		Transportation	no	13	300,000	3,900,000		
	ditto		Installation	no	13	100,000	1,300,000		
	ditto		Sand Filling	cu.m	37,996	1,000	37,996,000		
	Backfill Stone			cu.m	45,058	5,000	225,290,000		
	Crown Concrete			cu.m	2,348	17,000	39,916,000		
	Apron Concrete			cu.m	1,357	17,000	23,069,000		
	Installation of Fender			no	13	20,000,000	260,000,000		
	Land Reclamation	Land Reclamation		cu.m	485,750	1,500	728,625,000	1,321,002,000	
		Land Reclamation		cu.m	27,300	14,000	382,200,000		
	Pavement	Pavement		cu.m	27,300	14,000	382,200,000		
	Building	Building		sq.m	1,500	20,000	30,000,000		
	Utilities	Utilities		ts	1		142,025,550	2,840,519,000	
		(3)Sub Total					2,982,544,950		
Channel	Dredging	Channel Dredging		cu.m	3,327,808	400	1,331,123,200		
	Dredging	Turning/Birth Pocket		cu.m	2,072,404	400	828,961,600		
	Navigation Aids	Navigation Aids		no	18	270,000,000	4,900,000,000		
	(4)Sub Total					2,430,084,800			
Road	Access Road	Access Road		sq.m	15,000	10,000	150,000,000	9,970,259,185	
						150,000,000			
	(5)Sub Total					11,068,981,873			
	(1)-(5) Total					11,068,981,873			
Engineering Fee				L.S	1		1,106,258,783		
	Total			L.S	1		12,175,240,656		
Contingency				L.S	1		1,717,358,444		
Loading Equip't				L.S	1		2,033,480,000		
	Grand Total						15,424,515,885		

PORT OF CUTUCCO
QUANTITY CALCULATION SHEET

Place	Category	Main Work	Detailed Item	Unit	Quantity	Unit Cost	Cost	
Mobilization	Mobilization	Mobilization		LS	1		74,289,580	(Short Term 2006)
		Temporary Facilities		LS	1		7,428,959	742,895,800
	(1) Sub Total						81,718,539	
Container	Dredging	Removal of Soft Soil		cu.m	0	520	0	
	West Revetment	Foundation Rocks		cu.m	0	6,000	0	
	L-350 m	Concrete Caisson	Manufacture	cu.m	0	20,000	0	
			Transportation	no	0	150,000	0	
			Installation	no	0	50,000	0	
			Sand Filling	cu.m	0	1,000	0	
		Crown Concrete		cu.m	0	17,000	0	
	Container Wharf	Backfilling Stone	Backfilling Stone	cu.m	0	5,000	0	0
		Foundation Rocks		cu.m	0	6,000	0	
	L-300 m	Displacement of Soil		cu.m	0	1,500	0	
		Concrete Caisson	Manufacture	cu.m	0	20,000	0	
			Transportation	no	0	300,000	0	
			Installation	no	0	100,000	0	
			Sand Filling	cu.m	0	1,000	0	
		Backfilling Stone		cu.m	0	5,000	0	
		Crown Concrete		cu.m	0	17,000	0	
		Apron Concrete		cu.m	0	17,000	0	
		Grassy Foundation of Land Side		cu.m	0	18,000	0	
		Installation of Fender		no	9	20,000,000	0	
		Installation of Mooring Bit		no	0	5,000,000	0	
		Leaving Rail		meter	0	20,000	0	Wharf
	Land Reclamation	Land Reclamation		cu.m	0	1,500	0	0
	Pavement	Pavement		cu.m	0	14,000	0	
	Building	Building		sq.m	0	20,000	0	
	Utilities	Utilities		LS	0		0	0
	(2) Sub Total						0	
Multi Purpose (1)	Dredging	Removal of Soft Soil		cu.m	0	520	0	
	East Revetment	Foundation Rocks		cu.m	0	6,000	0	
	L-0 m	Concrete Caisson	Manufacture	cu.m	0	20,000	0	
			Transportation	no	0	150,000	0	
			Installation	no	0	50,000	0	
			Sand Filling	cu.m	0	1,000	0	
		Backfill Stone		cu.m	0	5,000	0	0
	Main Wharf	Foundation Rocks		cu.m	0	6,000	0	
	L-280 m	Displacement of Soil		cu.m	0	1,500	0	
		Concrete Caisson	Manufacture	cu.m	0	20,000	0	
			Transportation	no	0	300,000	0	
			Installation	no	0	100,000	0	
			Sand Filling	cu.m	0	1,000	0	
		Backfill Stone		cu.m	0	5,000	0	
		Crown Concrete		cu.m	0	17,000	0	
		Apron Concrete		cu.m	0	17,000	0	
		Installation of Mooring Bit		no	0	5,000,000	0	Multi
	Land Reclamation	Land Reclamation		cu.m	0	1,500	0	0
	Pavement	Pavement		cu.m	0	14,000	0	
	Building	Building		sq.m	0	20,000	0	
	Utilities	Utilities		LS	0		0	0
	(3) Sub Total						0	
Channel	Dredging	Channel Dredging		cu.m	1,155,560	400	462,224,000	
	Turning & Berth Pocket			cu.m	328,162	400	130,464,800	
	Navigation Aids	Navigation Aids		no	0		0	
	(4) Sub Total						592,688,800	
Road	Access Road	Access Road		sq.m	15,000	10,000	150,000,000	742,695,300
	(5) Sub Total						150,000,000	
	(1) (5) Total						824,393,448	
Engineering Fee	Total			LS	1		82,439,348	
Contingency	Grand Total			LS	1		906,832,796	
							20,983,219	
							927,816,015	
Mobilization	Mobilization	Mobilization		LS	1		301,983,140	
	Temporary Facilities			LS	1		30,799,714	3,079,837,400
	(1) Sub Total						332,782,854	
Multi Purpose (2)	Dredging	Removal of Soft Soil		cu.m	668,227	520	347,679,040	346,788,000
	East Revetment	Foundation Rocks		cu.m	22,174	6,000	132,842,400	
	L-140 m	Concrete Caisson	Manufacture	cu.m	22,174	20,000	443,482,000	
			Transportation	no	12	180,000	2,160,000	
			Installation	no	12	50,000	600,000	
			Sand Filling	cu.m	6,597	1,000	6,597,000	
		Crown Concrete		cu.m	178	17,000	3,026,000	
		Backfill Stone		cu.m	10,825	5,000	54,125,000	283,048,000 Revet
	Main Wharf	Foundation Rocks		cu.m	18,720	6,000	112,320,000	
	L-280 m	Displacement of Soil		cu.m	208,224	1,500	312,336,000	
		Concrete Caisson	Manufacture	cu.m	11,538	20,000	230,760,000	
			Transportation	no	12	300,000	3,600,000	
			Installation	no	12	100,000	1,200,000	
			Sand Filling	cu.m	37,998	1,000	37,998,000	
		Backfill Stone		cu.m	85,058	5,000	425,290,000	
		Crown Concrete		cu.m	2,844	17,000	48,148,000	
		Apron Concrete		cu.m	1,357	17,000	23,069,000	
		Installation of Fender		no	12	20,000,000	240,000,000	
		Installation of Mooring Bit		no	13	5,000,000	65,000,000	1,321,002,000 Main
	Land Reclamation	Land Reclamation		cu.m	253,200	1,500	379,800,000	
	Pavement	Pavement		cu.m	27,300	14,000	382,200,000	
	Building	Building		sq.m	1,500	20,000	30,000,000	
	Utilities	Utilities		LS	1		146,546,400	2,932,566,000
	(2) Sub Total						3,029,837,400	
Dredging	Berth Pocket			cu.m	0	400	0	
	(3) Sub Total						0	
	(1) (3) Total						3,418,287,514	3,079,837,400
Engineering Fee	Total			LS	1		341,827,751	
Contingency	(4) Total			LS	1		3,760,115,265	
	Grand Total			LS	1		3,789,022,221	
Leading Extra	Installation of Gravity Gates			LS	0		0	
							5,133,717,054	

PLAN (-12m-13m)
 C-1 Short Term (-12m) 2005

PORT OF CUTUCO
 QUANTITY CALCULATION SHEET

Place	Category	Main Work	Detailed Item	Unit	Quantity	Unit Cost	Cost		
Mobilization	Mobilization	Mobilization		L.S.	1		1,302,788,558	(Short Term 2005)	
		Temporary Facilities		L.S.	1		120,228,888	12,027,609,582	
	(Sub Total)						1,323,017,446		
Container	West Revetment L=400 m	Excavating	Removal of Soft Soil	cum	80,980	520	42,109,240		
			Foundation Rocks	cum	23,520	6,000	141,120,000		
			Concrete Caisson	Manufacture	cum	7,404	20,000	148,080,000	
				Transportation	no	30	150,000	4,500,000	
				Installation	no	30	50,000	1,500,000	
				Sand Filling	cum	16,178	1,000	16,178,000	
				Crown Concrete	cum	480	17,000	8,160,000	
				Backfilling Stone	cum	19,972	4,000	79,888,000	423,368,000 Revet
					cum	3,733	228,000	850,244,000	
				Steel Pipe Pile	ton	3,184	219,000	698,639,000	
	Container Wharf L=300 m		Steel Sheet Pile Pile	ton	30	243,000	7,290,000		
			Steel Pipe Pile for Crane	ton	30	243,000	7,290,000		
			Inclined Steel Pipe Pile	ton	1,171	284,200	332,658,200		
			Concrete of Super Structure	cum	5,280	25,000	132,000,000		
			Crown Concrete	cum	1,858	17,000	31,586,000		
			Backfill Stone	cum	83,780	5,000	418,900,000		
			Foot Protection Stone	cum	25,092	6,000	150,552,000		
			Installation of Fender	no	15	20,000,000	300,000,000		
			Installation of Mooring Bit	no	15	5,000,000	75,000,000		
			Landing Rail	meter	560	20,000	11,200,000	2,655,305,000 Wharf	
	Land Reclamation	Land Reclamation		cum	918,750	1,500	1,378,125,000		
	Pavement	Pavement		cum	31,500	14,000	441,000,000		
	Building	Building		sqm	1,500	20,900	31,350,000		
Utilities	Utilities		ls	1		251,975,850	5,159,517,200		
	(Sub Total)					5,417,493,000			
Multi Purpose (1)	East Revetment L=30 m	Excavating	Removal of Soft Soil	cum	52,832	520	27,472,640		
			Foundation Rocks	cum	0	6,000	0		
			Concrete Caisson	Manufacture	cum	0	20,000	0	
				Transportation	no	0	150,000	0	
				Installation	no	0	50,000	0	
				Sand Filling	cum	0	1,000	0	
				Backfill Stone	cum	0	5,000	0	
				Steel Pipe Pile	ton	3,323	128,000	426,144,000	
				Steel Sheet Pile Pile	ton	2,257	219,000	494,283,000	
				Steel Pipe Pile for Crane	ton	0	0	0	
	Main Wharf L=250 m		Inclined Steel Pipe Pile	ton	970	282,200	273,934,000		
			Concrete of Super Structure	cum	4,576	20,000	91,520,000		
			Crown Concrete	cum	1,420	17,000	24,140,000		
			Backfill Stone	cum	55,224	5,000	276,120,000		
			Foot Protection Stone	cum	21,146	6,000	126,876,000		
			Installation of Fender	no	15	20,000,000	300,000,000		
			Installation of Mooring Bit	no	15	5,000,000	75,000,000		
			Land Reclamation	Land Reclamation	cum	882,000	1,500	1,323,000,000	2,463,017,000 MJS
			Pavement	Pavement	cum	27,528	14,000	385,392,000	
			Building	Building	sqm	1,500	20,900	31,350,000	
		Utilities	Utilities	ls	1		211,284,482	4,225,889,840	
		(Sub Total)					4,438,974,122		
	Channel	Excavating	Channel Excavating	cum	3,521,487	400	1,408,594,800		
Excavating		Turning Basin	cum	981,519	400	392,607,600			
Navigation Aids		Navigation Aids	no	18		270,000,000			
	(Sub Total)					2,071,202,400			
Road	Access Road	Access Road	sqm	15,000	10,000	150,000,000			
	(Sub Total)					150,000,000	12,027,609,582		
	(1) (5) Total					13,353,713,236			
Engineering Fee				L.S.	1		1,355,071,324		
Total				L.S.	1		14,965,784,560		
Contingency				L.S.	1		1,496,578,456		
Loading Equip's				L.S.	1		7,039,490,500		
	Grand Total						18,147,823,016		

PLAN (-12m~13m)
 C-1 Long Term (-13m) 2015

PORT OF CUTUO
 QUANTITY CALCULATION SHEET

Place	Category	Main Work	Detailed Item	Unit	Quantity	Unit Cost	Cost
Mobilization	Mobilization	Mobilization		LS	1		82,915,230 (Short Term 2005)
		Temporary Facilities		LS	1		629,152,800
	(1)Sub Total						69,204,808
Container	Dredging	Removal of Soft Soil		cu.m	0	520	0
	East Revetment	Foundation Rocks		cu.m	0	6,000	0
		Concrete Caisson	Manufacture	cu.m	0	20,000	0
	L=400 m	ditto	Transportation	no	0	150,000	0
		ditto	Installation	no	0	50,000	0
		ditto	Sand Filling	cu.m	0	1,000	0
		Crown Concrete		cu.m	0	17,000	0
		Backfilling Stone	Backfilling Stone	cu.m	0	5,000	0
	Container Wharf	Steel Pipe Pile		ton	0	228,000	0
		Steel Sheet Pipe Pile		ton	0	219,000	0
	L=300 m	Steel Pipe Pile for Crane		ton	0	228,000	0
		Inclined Steel Pipe Pile		ton	0	282,200	0
		Concrete of Super Structure		cu.m	0	20,000	0
		Crown Concrete		cu.m	0	17,000	0
		Backfill Stone		cu.m	0	5,000	0
		Foot Protection Stone		cu.m	0	6,000	0
		Installation of Fender		no	0	20,000,000	0
		Installation of Mooring Bit		no	0	5,000,000	0
		Lantern Post		meter	0	20,000	0
	Land Reclamation	Land Reclamation		cu.m	0	1,500	0
	Pavement	Pavement		sq.m	0	14,000	0
	Building	Building		sq.m	0	20,000	0
	Utilities	Utilities		ls	0	0	0
	(2)Sub Total						0
Multi Purpose 1)	Dredging	Removal of Soft Soil		cu.m	0	520	0
	East Revetment	Foundation Rocks		cu.m	0	6,000	0
		Concrete Caisson	Manufacture	cu.m	0	20,000	0
	L=0 m	ditto	Transportation	no	0	150,000	0
		ditto	Installation	no	0	50,000	0
		ditto	Sand Filling	cu.m	0	1,000	0
		Backfill Stone		cu.m	0	5,000	0
	Main Wharf	Steel Pipe Pile		ton	0	228,000	0
		Steel Sheet Pipe Pile		ton	0	219,000	0
	L=260 m	Steel Pipe Pile for Crane		ton	0	228,000	0
		Inclined Steel Pipe Pile		ton	0	282,200	0
		Concrete of Super Structure		cu.m	0	20,000	0
		Crown Concrete		cu.m	0	17,000	0
		Backfill Stone		cu.m	0	5,000	0
		Foot Protection Stone		cu.m	0	6,000	0
		Installation of Fender		no	0	20,000,000	0
		Installation of Mooring Bit		no	0	5,000,000	0
	Land Reclamation	Land Reclamation		cu.m	0	1,500	0
	Pavement	Pavement		sq.m	0	14,000	0
	Building	Building		sq.m	0	20,000	0
	Utilities	Utilities		ls	0	0	0
	(3)Sub Total						0
Channel	Dredging	Channel Dredging		cu.m	1,155,590	400	462,232,000
	Dredging	Turning Basin		cu.m	417,302	400	166,920,800
		Navigation Aids		no	0	0	0
	(4)Sub Total						629,152,800
Road	Access Road	Access Road		sq.m	0	10,000	0
	(5)Sub Total						0
	(1)(5) Total						629,152,800
Engineering Fee				LS	1		89,835,941
	Total						788,195,582
Contingency				LS	1		76,819,552
	Grand Total						865,015,128
Mobilization	Mobilization	Mobilization		LS	1		445,229,462 (Long Term 2015)
		Temporary Facilities		LS	1		44,856,131
	(1)Sub Total						490,085,593
Multi Purpose 2)	Dredging	Removal of Soft Soil		cu.m	52,892	520	27,492,840
	East Revetment	Foundation Rocks		cu.m	17,052	6,000	102,312,000
		Concrete Caisson	Manufacture	cu.m	5,366	20,000	107,320,000
	L=290 m	ditto	Transportation	no	38	150,000	5,400,000
		ditto	Installation	no	26	50,000	1,300,000
		ditto	Sand Filling	cu.m	11,673	1,000	11,673,000
		Crown Concrete		cu.m	348	17,000	5,916,000
		Backfill Stone		cu.m	13,830	5,000	69,150,000
	Main Wharf	Steel Pipe Pile		ton	3,232	228,000	737,844,000
		Steel Sheet Pipe Pile		ton	2,757	219,000	603,743,000
	L=260 m	Steel Pipe Pile for Crane		ton	0	0	0
		Inclined Steel Pipe Pile		ton	910	282,200	254,734,000
		Concrete of Super Structure		cu.m	4,576	20,000	91,520,000
		Crown Concrete		cu.m	1,420	17,000	24,140,000
		Backfill Stone		cu.m	55,234	5,000	276,170,000
		Foot Protection Stone		cu.m	21,744	6,000	130,478,000
		Installation of Fender		no	13	20,000,000	260,000,000
		Installation of Mooring Bit		no	13	5,000,000	65,000,000
	Land Reclamation	Land Reclamation		cu.m	490,000	1,500	735,000,000
	Pavement	Pavement		sq.m	23,300	14,000	326,200,000
	Building	Building		sq.m	1,500	20,000	30,000,000
	Utilities	Utilities		ls	1	0	217,014,032
	(2)Sub Total						4,452,294,622
Dredging		Beach Pocket		cu.m	0	400	0
	(3)Sub Total						0
	(1)(2)(3) Total						4,452,220,230
Engineering Fee				LS	1		494,222,022
	Total						5,438,442,252
Contingency				LS	1		543,944,220
	Grand Total						5,982,386,472
Loading Equip't		Installation of Gantry Cranes		LS	0		0
							6,825,101,653

PLAN (12m-13m)
C-2 Short Term-12m) 2005

PORT OF CUTUCO
QUANTITY CALCULATION SHEET

Place	Category	Main Work	Detailed Item	Unit	Quantity	Unit Cost	Cost		
Mobilization	Mobilization	Mobilization		L.S.	1		1,049,825,383	(Short Term 2005)	
		Temporary Facilities		L.S.	1		104,993,839	10,499,353,839	
	(1)Sub Total						1,154,819,222		
Container	Dredging	West Revetment	Removal of Soft Soil	cu.m	0	520	81,031,000		
			Foundation Rocks	cu.m	11,172	8,000	70,320,000		
			Concrete Caisson	Manufacture	cu.m	3,518	20,000	70,320,000	
				Transportation	no	24	150,000	3,600,000	
				Installation	no	24	50,000	1,200,000	
				Sand Filling	cu.m	7,661	1,000	7,661,000	
				Crown Concrete	cu.m	228	17,000	3,876,000	
				Backfilling Stone	cu.m	8,930	8,000	44,050,000	194,514,934 Revet
				Steel Pipe Pile	ton	3,773	228,000	860,244,000	
				Steel Sheet Pile Pile	ton	3,181	219,000	696,439,000	
	L=400 m	Container Wharf	Steel Pipe Pile for Crane	ton	70	228,000	15,960,000		
			Inclined Steel Pipe Pile	ton	1,170	228,000	265,836,000		
			Concrete of Super Structure	cu.m	5,280	20,000	105,600,000		
			Crown Concrete	cu.m	1,838	17,000	31,246,000		
			Backfill Stone	cu.m	83,720	8,000	669,760,000		
			Foot Protection Stone	cu.m	25,082	4,000	100,328,000		
			Installation of Fender	no	15	20,000,000	300,000,000		
			Installation of Mooring Bit	no	15	5,000,000	75,000,000	2,555,305,000 Wharf	
			Laying Rail	meter	560	20,000	11,200,000		
			Land Reclamation	Land Reclamation	cu.m	568,000	1,000	568,000,000	
	L=300 m	Land Reclamation	Pavement	Pavement	sq.m	31,500	14,000	441,000,000	
			Building	Building	sq.m	1,500	20,000	30,000,000	4,402,819,934
			Utilities	Utilities	lg	1		220,140,358	
(2)Sub Total							4,922,980,363		
Multi Purpose (1)	Dredging	East Revetment	Removal of Soft Soil	cu.m	0	420	0		
			Foundation Rocks	cu.m	0	8,000	0		
			Concrete Caisson	Manufacture	cu.m	0	20,000	0	
				Transportation	no	0	150,000	0	
				Installation	no	0	50,000	0	
				Sand Filling	cu.m	0	1,000	0	
				Backfill Stone	cu.m	0	5,000	0	
				Steel Pipe Pile	ton	3,321	228,000	757,644,000	
				Steel Sheet Pile Pile	ton	2,757	219,000	603,783,000	
			L=0 m	Main Wharf	Steel Pipe Pile for Crane	ton	0	0	0
	Inclined Steel Pipe Pile	ton			370	282,200	104,414,000		
	Concrete of Super Structure	cu.m			4,878	20,000	97,560,000		
	Crown Concrete	cu.m			1,420	17,000	24,140,000		
	Backfill Stone	cu.m			55,224	5,000	276,120,000		
	Foot Protection Stone	cu.m			21,748	8,000	173,984,000		
	Installation of Fender	no			13	20,000,000	260,000,000		
	Installation of Mooring Bit	no			13	2,000,000	26,000,000	2,480,017,000 Multi	
	Land Reclamation	Land Reclamation			cu.m	457,000	1,500	685,500,000	
	Pavement	Pavement			sq.m	2,506	14,000	35,084,000	
	L=260 m	Land Reclamation	Building	Building	sq.m	1,500	20,000	30,000,000	
			Utilities	Utilities	lg	1		178,850,856	3,572,217,000
			(3)Sub Total					2,758,077,650	
	Channel	Dredging	Channel Dredging		cu.m	3,821,487	400	1,408,594,800	
				cu.m	729,300	400	291,720,000		
Navigation Aids				Navigation Aids	no	18		270,000,000	
	(4)Sub Total					1,970,314,800			
Road	Access Road	Access Road		sq.m	15,000	10,000	150,000,000		
			(5)Sub Total					150,000,000	10,499,353,839
	(1)-(5) Total					11,654,282,533			
Engineering Fee				L.S.	1		1,145,428,253		
Total							12,819,710,786		
Contingency				L.S.	1		1,281,971,929		
Loading Equip't				L.S.	1		2,083,460,000		
Grand Total							16,185,144,715		

PORT OF CUTUCO
QUANTITY CALCULATION SHEET

Phase	Category	Main Work	Detailed Item	Unit	Quantity	Unit Cost	Cost
Mobilization	Mobilization	Mobilization	Mobilization	L.S	1		65,215,280 (Short Term 2005)
		Temporary Facilities	Temporary Facilities	L.S	1		652,152,800
	(1)Sub Total						717,368,080
Container	East Revetment	Removal of Soft Soil		cu.m	0	520	0
		Foundation Rocks		cu.m	0	8,000	0
		Concrete Caisson	Manufacture	cu.m	0	20,000	0
			Transportation	no	0	150,000	0
			Installation	no	0	50,000	0
			Sand Filling	cu.m	0	1,000	0
		Crown Concrete		cu.m	0	17,000	0
		Backfill Stone	Backfilling Stone	cu.m	0	5,000	0
				cu.m	0	228,000	0
		Steel Pipe Pile		ton	0	219,000	0
		Steel Sheet Pile Pile		ton	0	228,000	0
		Steel Pipe Pile for Crane		ton	0	242,200	0
		Inclined Steel Pipe Pile		ton	0	282,200	0
		Concrete of Super Structure		cu.m	0	20,000	0
		Crown Concrete		cu.m	0	17,000	0
		Backfill Stone		cu.m	0	5,000	0
		Foot Protection Stone		cu.m	0	8,000	0
		Installation of Fender		no	0	20,000,000	0
		Installation of Mooring Bit		no	0	5,000,000	0
		Land Reclamation	Land Reclamation	cu.m	0	1,500	0
		Pavement	Pavement	sq.m	0	14,000	0
		Building	Building	sq.m	0	20,000	0
		Utilities	Utilities	ta	0		0
	(2)Sub Total						0
Multi Purpose (1)	East Revetment	Removal of Soft Soil		cu.m	0	520	0
		Foundation Rocks		cu.m	0	8,000	0
		Concrete Caisson	Manufacture	cu.m	0	20,000	0
			Transportation	no	0	150,000	0
			Installation	no	0	50,000	0
			Sand Filling	cu.m	0	1,000	0
		Backfill Stone		cu.m	0	5,000	0
		Steel Pipe Pile		ton	0	228,000	0
		Steel Sheet Pile Pile		ton	0	219,000	0
		Steel Pipe Pile for Crane		ton	0	242,200	0
		Inclined Steel Pipe Pile		ton	0	282,200	0
		Concrete of Super Structure		cu.m	0	20,000	0
		Crown Concrete		cu.m	0	17,000	0
		Backfill Stone		cu.m	0	5,000	0
		Foot Protection Stone		cu.m	0	8,000	0
		Installation of Fender		no	0	20,000,000	0
		Installation of Mooring Bit		no	0	5,000,000	0
		Land Reclamation	Land Reclamation	cu.m	0	1,500	0
		Pavement	Pavement	sq.m	0	14,000	0
		Building	Building	sq.m	0	20,000	0
		Utilities	Utilities	ta	0		0
	(3)Sub Total						0
Channel	Channel Dredging	Channel Dredging		cu.m	1,155,580	400	462,232,000
	Turning Berth Pocket	Turning Berth Pocket		cu.m	474,802	400	189,920,800
	Navigation Aids	Navigation Aids		no	0		0
	(4)Sub Total						652,152,800
Road	Access Road	Access Road		sq.m	0	10,900	0
	(5)Sub Total						652,152,800
Engineering Fee				L.S	1		723,889,866
	Total						72,388,981
Contingency				L.S	1		796,278,569
	Grand Total						79,627,857
							875,908,426
Mobilization	Mobilization	Mobilization		L.S	1		429,268,870 (Long Term 2015)
		Temporary Facilities		L.S	1		42,926,867
	(1)Sub Total						472,195,737
Multi Purpose (2)	East Revetment	Removal of Soft Soil		cu.m	21,000	520	10,920,000
		Foundation Rocks		cu.m	20,580	5,000	103,450,000
		Concrete Caisson	Manufacture	cu.m	6,478	20,000	129,520,000
			Transportation	no	44	150,000	6,600,000
			Installation	no	44	50,000	2,200,000
			Sand Filling	cu.m	14,112	1,000	14,112,000
		Crown Concrete		cu.m	420	17,000	7,140,000
		Backfill Stone		cu.m	17,453	5,000	87,465,000
		Steel Pipe Pile		ton	3,323	223,000	741,044,000
		Steel Sheet Pile Pile		ton	2,757	219,000	603,783,000
		Steel Pipe Pile for Crane		ton	0		0
		Inclined Steel Pipe Pile		ton	970	282,200	274,324,000
		Concrete of Super Structure		cu.m	4,575	20,000	91,500,000
		Crown Concrete		cu.m	1,420	17,000	24,140,000
		Backfill Stone		cu.m	55,274	5,000	276,370,000
		Foot Protection Stone		cu.m	21,749	8,000	174,000,000
		Installation of Fender		no	13	20,000,000	260,000,000
		Installation of Mooring Bit		no	13	5,000,000	65,000,000
		Land Reclamation	Land Reclamation	cu.m	354,400	1,500	531,600,000
		Pavement	Pavement	sq.m	27,300	14,000	382,200,000
		Building	Building	sq.m	1,500	20,000	30,000,000
		Utilities	Utilities	ta	1		204,412,700
	(2)Sub Total						4,292,688,700
							0
	Total						4,794,880,367
Engineering Fee				L.S	1		474,488,004
	Total						9,241,348,941
Contingency				L.S	1		524,134,804
	Grand Total						9,765,483,745
							9,841,317,970

PLAN (-12m-13m)
C-3 Short Term(-12m) 2003

PORT OF CUTUCCO
QUANTITY CALCULATION SHEET

Place	Category	Main Work Items	Detailed Work Items	Unit	Quantity	Unit Cost	Cost
Mobilization	Mobilization	Mobilization		ts	1		925,735,149 (Short Term 2005)
		Temporary Facilities		ts	1		925,735,149
	(1)Sub Total						1,018,308,694
CONTAINER	Dredging	Removal of Soft Soil		cu.m	198,475	520	103,207,500
	West Revett	Foundation Rock		cu.m	40,320	6,000	241,920,000
		Concrete Caisson	Manufacture	cu.m	4,867	20,000	97,340,000
			Transportation	no	35	150,000	5,250,000
			Installation	no	35	50,000	1,750,000
			Sand Filling	cu.m	11,129	1,000	11,129,000
		Backfill Stone		cu.m	37,900	5,000	189,500,000
		Crown Concrete		cu.m	320	17,000	5,440,000
	Container Wharf	Foundation Rocks		cu.m	6,100	6,000	36,600,000
		Displacement of Soil		cu.m	0	1,500	0
		Concrete Caisson	Manufacture	cu.m	18,800	20,000	376,000,000
			Transportation	no	15	200,000	3,000,000
			Installation	no	15	100,000	1,500,000
			Sand Filling	cu.m	43,842	1,000	43,842,000
		Backfill Stone		cu.m	54,000	3,000	162,000,000
		Crown Concrete		cu.m	3,268	17,000	55,556,000
		Aspen Concrete		cu.m	1,569	17,000	26,673,000
		Crown Foundation of Land Side		cu.m	1,002	18,000	18,036,000
		Installation of Fender		no	15	20,000,000	300,000,000
		Installation of Mooring Bit		no	15	5,000,000	75,000,000
		Landing Rail		meter	560	20,000	11,200,000
	Land Reclamation	Land Reclamation		cu.m	897,200	1,500	1,345,800,000
	Pavement	Pavement		cu.m	31,500	14,000	441,000,000
	Building	Building		sq.m	1,500	20,000	30,000,000
	Utilities	Utilities		ts	1		177,684,000
	(2)Sub Total						3,771,254,000
MULTI PURPOSE (1)	Dredging	Removal of Soft Soil		cu.m	90,840	520	47,436,800
		Blowup Hard Rock		cu.m	0	10,000	0
	East Revettment	Foundation Rocks		cu.m	0	6,000	0
		Concrete Caisson	Manufacture	cu.m	0	20,000	0
			Transportation	no	0	150,000	0
			Installation	no	0	50,000	0
			Sand Filling	cu.m	0	1,000	0
		Backfill Stone		cu.m	0	5,000	0
	Main Wharf	Foundation Rocks		cu.m	7,020	6,000	42,120,000
		Displacement of Soil		cu.m	0	1,500	0
		Concrete Caisson	Manufacture	cu.m	11,566	20,000	231,320,000
			Transportation	no	13	300,000	3,900,000
			Installation	no	13	100,000	1,300,000
			Sand Filling	cu.m	37,999	1,000	37,999,000
		Backfill Stone		cu.m	48,800	5,000	244,000,000
		Crown Concrete		cu.m	2,848	17,000	48,416,000
		Aspen Concrete		cu.m	1,357	17,000	23,069,000
		Installation of Fender		no	13	20,000,000	260,000,000
		Installation of Mooring Bit		no	13	5,000,000	65,000,000
	Land Reclamation	Land Reclamation		cu.m	1,235,000	1,500	1,852,500,000
	Pavement	Pavement		cu.m	23,300	14,000	326,200,000
	Building	Building		sq.m	1,500	20,000	30,000,000
	Utilities	Utilities		ts	1		182,174,890
	(3)Sub Total						3,405,672,690
CHANNEL	Dredging	Channel Dredging		cu.m	3,521,487	400	1,408,594,800
		Tying Berth Pocket		cu.m	728,300	400	291,720,000
	Navigation Aids	Navigation Aids		no	15		270,000,000
	(4)Sub Total						1,970,314,800
ROAD	Access Road	Access Road		sq.m	15,000	10,000	150,000,000
	(5)Sub Total						150,000,000
	(1) (1) Total						10,276,660,164
Engineering Fee				L.S	1		1,027,566,015
	Total						11,304,226,179
Contingency				L.S	1		1,130,322,817
Loading Equip't				L.S	1		2,053,450,000
	Grand Total						14,487,008,788

PLAN (-12m-13m)
C-3 Long Term(-13m) 2015

PORT OF CUTUCO
QUANTITY CALCULATION SHEET

Place	Category	Main Work Items	Detailed Work Items	Unit	Quantity	Unit Cost	Cost	
Mobilization	Mobilization	Mobilization		LS	1		21,005,280	
		Temporary Facilities		LS	1		61,000,528	
	(1) Sub Total						82,105,808	
CONTAINER	Dredging	Removal of Soft Soil		cu.m	0	0	0	
		Foundation Rock		cu.m	0	0	0	
		Concrete Caisson	Manufacture	cu.m	0	20,000	0	
		ditto	Transportation	no	0	150,000	0	
		ditto	Installation	no	0	50,000	0	
		ditto	Sand Filling	cu.m	0	1,000	0	
		Backfilling Stone		cu.m	0	5,000	0	
		Crown Concrete		cu.m	0	17,000	0	
		Foundation Rocks		cu.m	0	6,000	0	
		Displacement of Soil		cu.m	0	1,500	0	
		Concrete Caisson	Manufacture	cu.m	0	20,000	0	
	Container Wharf	L=300 m	ditto	Transportation	no	0	200,000	0
			ditto	Installation	no	0	100,000	0
			ditto	Sand Filling	cu.m	0	1,000	0
			Backfilling Stone		cu.m	0	5,000	0
			Crown Concrete		cu.m	0	17,000	0
			Apron Concrete		cu.m	0	17,000	0
			Crane Foundation of Land Side		cu.m	0	18,000	0
			Installation of Fender	no	0	20,000,000	0	
			Installation of Mooring Bit	no	0	5,000,000	0	
			Luxury Ref	meter	0	20,000	0	
Land Reclamation	Land Reclamation	cu.m	0	1,500	0			
Pavement	Pavement	cu.m	0	14,000	0			
Building	Building	sq.m	0	20,000	0			
Utilities	Utilities	LS	0	0	0			
(2) Sub Total						0		
MULTI PURPOSE (1)	Dredging	Removal of Soft Soil		cu.m	0	520	0	
		Blasting Hard Rock		cu.m	0	10,000	0	
		Foundation Rocks		cu.m	0	0	0	
		Concrete Caisson	Manufacture	cu.m	0	20,000	0	
		ditto	Transportation	no	0	150,000	0	
		ditto	Installation	no	0	50,000	0	
		ditto	Sand Filling	cu.m	0	1,000	0	
		Backfill Stone		cu.m	0	5,000	0	
		Foundation Rocks		cu.m	0	3,000	0	
		Displacement of Soil		cu.m	0	1,500	0	
		Concrete Caisson	Manufacture	cu.m	0	20,000	0	
	Main Wharf	L=290 m	ditto	Transportation	no	0	200,000	0
			ditto	Installation	no	0	100,000	0
			ditto	Sand Filling	cu.m	0	1,000	0
			Backfill Stone		cu.m	0	5,000	0
			Crown Concrete		cu.m	0	17,000	0
			Apron Concrete		cu.m	0	17,000	0
			Installation of Fender	no	0	20,000,000	0	
			Installation of Mooring Bit	no	0	5,000,000	0	
			Land Reclamation	Land Reclamation	cu.m	0	1,500	0
			Pavement	Pavement	cu.m	0	14,000	0
Building	Building	sq.m	0	20,000	0			
Utilities	Utilities	LS	0	0	0			
(3) Sub Total						0		
CHANNEL	Dredging	Channel Dredging		cu.m	1,155,580	400	462,232,000	
	Dredging	Turning Basin Pocket		cu.m	269,552	400	107,820,800	
	Navigation Aids	Navigation Aids		no	0	0	0	
(4) Sub Total						610,052,800		
ROAD	Access Road	Access Road		sq.m	0	10,000	0	
(5) Sub Total						0		
Engineering Fee	Total			LS	1		677,158,808	
Contingency	Total			LS	1		744,874,468	
Grand Total							819,383,314	
Mobilization	Mobilization	Mobilization		LS	1		281,093,864	
		Temporary Facilities		LS	1		28,103,388	
(1) Sub Total							309,197,252	
Multi Purpose (2)	Dredging	Removal of Soft Soil		cu.m	252,000	1,500	378,000,000	
		Foundation Rock		cu.m	2,670	8,000	21,360,000	
		Concrete Caisson	Manufacture	cu.m	880	20,000	17,600,000	
		ditto	Transportation	cu.m	8	150,000	950,000	
		ditto	Installation	cu.m	8	50,000	400,000	
		ditto	Sand Filling	cu.m	1,980	1,000	1,980,000	
		Crown Concrete		cu.m	60	17,000	1,020,000	
		Backfill Stone		cu.m	6,750	5,000	33,750,000	
		Foundation Rocks		cu.m	7,020	8,000	56,160,000	
		Displacement of Soil		cu.m	0	0	0	
		Main Wharf (2)	L=290 m	Concrete Caisson	Manufacture	cu.m	11,568	20,000
	ditto			Transportation	no	13	200,000	2,600,000
	ditto			Installation	no	13	100,000	1,300,000
	ditto			Sand Filling	cu.m	27,868	1,000	27,868,000
	Backfill Stone				cu.m	48,800	5,000	244,000,000
	Crown Concrete				cu.m	2,548	17,000	43,316,000
	Apron Concrete				cu.m	1,267	17,000	21,539,000
	Installation of Fender			no	17	20,000,000	340,000,000	
	Installation of Mooring Bit			no	17	5,000,000	85,000,000	
	Land Reclamation			Land Reclamation	cu.m	880,000	1,500	1,320,000,000
	Pavement	Pavement	cu.m	21,200	14,000	296,800,000		
Building	Building	sq.m	1,500	20,000	30,000,000			
Utilities	Utilities	LS	1	0	174,301,640			
(2) Sub Total						2,610,336,640		
Dredging	Barth Pocket			cu.m	0	0	0	
(1)(2) Total						2,610,425,800		
Engineering Fee	Total			LS	1		289,747,589	
Contingency	Total			LS	1		318,722,439	
Grand Total							3,218,945,827	
LOADING EQUIP		Installation of Gantry Cranes		LS	1		0	
							4,325,907,743	

PORT OF CUTUGO

Original Plan Short Term(-12m) to Long Term(-13m)
DREDGING VOLUME

1 Turning Basin			2005				2015	
Plan	Existing Average Depth (m)	Turning Basin Dredging Volume (cu.m)	Planned Dimension	Dredging Volume (cu.m)	Planned Dimension	*Additional 1m cutting (cu.m)		
A-1	10.4	431,242	Depth: -12 m Width: 600 m Slope: 1 : 5	767,079	Depth: -13 m Width: 600 m Slope: 1 : 5	338,437		
B-1	8.5	1,049,012		1,371,348		322,336		
B-2	7.3	1,371,349		1,772,016		400,667		
B-3	7.2	1,536,435		1,806,097		269,662		
C-1	10.0	584,650		891,702		307,052		

2 Berth Pocket			2005				2015		Alternative
Plan	Existing Depth (m)	Dredging Volume (cu.m)	Planned Dimension	Dredging Volume (cu.m)	Planned Dimension	Dredging Volume (cu.m)	Planned Depth		
A-1		984,330	Depth: -13 m Width: 50m Slope: 1 : 5 Basin Depth: -12 m	155,000	*Additional 1m cutting Basin Depth: -13 m	622,289	Depth: -11.5 m		
B-1		677,134		141,250		609,408			
B-2		1,127,607		115,250		1,069,862			
B-3		535,969		56,500		507,219			
C-1		276,869		110,250		221,244			
C-2		547,620	167,750	455,240					
C-3		144,650	62,500	113,600					

3 Inner Channel						
Plan	Existing Depth (m)	Inner Channel Dredging Volume (cu.m)	Length of Channel (m)	Planned Dimension	Dredging Volume (cu.m)	Planned Dimension
A-1	7.4 ~ 22.0	2,277,747	4,800	Depth: -12 m Width: 150 m Slope: 1 : 5	1,395,572	Depth: -11.5 m
B-1	6.4 ~ 22.0	2,195,961	3,250		1,395,572	
B-2	6.4 ~ 22.0	2,286,324	3,400		2,286,324	
B-3	6.4 ~ 22.0	2,131,168	3,200		2,131,168	
C-1	7.4 ~ 22.0	2,324,847	5,400		1,196,640	

4 Outer Channel						
Plan	Existing Depth (m)	Outer Channel Dredging Volume (cu.m)	Length of Channel (m)	Planned Dimension	Dredging Volume (cu.m)	Planned Dimension
	10.3 ~ 13.0	1,196,640	6,500	Depth: -12 m Width: 150 m Slope: 1 : 3	604,519	Depth: -11.5 m
	10.3 ~ 13.0	2,352,220	8,000		1,155,580	

5 Short Term Development (2005)							
Plan	Turning Basin (-12m) (cu.m)	Berth Pocket (-13m) (cu.m)	Sub Total	Inner Channel (-12m) (cu.m)	Outer Channel (-12m) (cu.m)	Sub Total	Total Volume (cu.m)
A-1	431,242	984,330	1,395,572	2,277,747	1,196,640	3,474,387	4,869,959
B-1	1,049,012	677,134	1,726,146	2,195,961	1,196,640	3,392,601	5,118,747
B-2	1,371,349	1,127,607	2,498,956	2,288,524	1,196,640	3,485,164	5,984,120
B-3	1,536,435	535,969	2,072,404	2,131,168	1,196,640	3,327,808	5,400,212
C-1	584,650	276,869	861,519	2,324,847	1,196,640	3,521,487	4,383,006
C-2	584,650	547,620	1,132,270	2,324,847	1,196,640	3,521,487	4,653,757
C-3	584,650	144,650	729,300	2,324,847	1,196,640	3,521,487	4,250,787

6 Long Term Development							
Plan	Turning Basin (-13m) (cu.m)	Berth Pocket (-13m) (cu.m)	Sub Total	Inner Channel (-12m) (cu.m)	Outer Channel (-13m) (cu.m)	Sub Total	Total Volume (cu.m)
A-1	338,437	155,000	491,437	0	1,155,580	1,155,580	1,647,017
B-1	322,336	141,250	463,586	0	1,155,580	1,155,580	1,619,166
B-2	400,667	115,250	515,917	0	1,155,580	1,155,580	1,671,497
B-3	269,662	56,500	326,162	0	1,155,580	1,155,580	1,481,742
C-1	307,052	110,250	417,302	0	1,155,580	1,155,580	1,572,882
C-2	307,052	167,750	474,802	0	1,155,580	1,155,580	1,630,382
C-3	307,052	62,500	369,552	0	1,155,580	1,155,580	1,525,132

*Additional *Additional *Additional *Additional *Additional

PORT OF CUTUCO

Original Plan Short Term(-12m) to Long Term(-13m)

DREDGING VOLUME

Plan	2005		Planned Dimension	Dredging Volume (cu.m)	2015	
	Existing Average Depth (m)	Turning Basin Dredging Volume (cu.m)			Planned Dimension	*Additional 1m cutting (cu.m)
A-1	10.4	431,242	Depth: -12 m	767,679	Depth: -13 m	338,437
B-1	8.5	1,049,012	Width: 600 m	1,371,348	Width: 600 m	322,336
B-2	7.3	1,371,349	Slope: 1:5	1,772,016	Slope: 1:5	400,667
B-3	7.2	1,536,435		1,806,097		269,662
C-1	10.0	584,650		891,702		307,052

Plan	2005		Planned Dimension	Dredging Volume (cu.m)	2015		Alternative Planned Depth
	Existing Depth (m)	Dredging Volume (cu.m)			Planned Dimension	Dredging Volume (cu.m)	
A-1		964,330	Depth: -13 m	155,000	*Additional 1m cutting	692,285	Basin Depth: -11.5 m
B-1		677,134	Width: 50m	141,250		606,609	
B-2		1,127,607	Slope: 1:5	115,250		1,069,692	
B-3		535,969		56,500		507,719	
C-1		276,869	Basin	110,250	Basin	221,744	
C-2		547,620	Depth: -12 m	167,750	Depth: -13 m	463,745	
C-3		144,650		62,500		113,400	

Plan	Existing Depth (m)	Inner Channel Dredging Volume (cu.m)	Length of Channel (m)	Planned Dimension	Dredging Volume (cu.m)	Planned dimension
A-1	7.4	2,277,747	4,800	Depth: -12 m	1,906,947	Depth: -11.5 m
B-1	6.4	2,195,961	3,250	Width: 150 m	1,944,690	
B-2	6.4	2,286,524	3,400	Slope: 1:5	2,043,524	
B-3	6.4	2,131,168	3,200		1,871,560	
C-1	7.4	2,324,847	5,400		1,490,547	

Plan	Existing Depth (m)	Outer Channel Dredging Volume (cu.m)	Length of Channel (m)	Planned Dimension	Dredging Volume (cu.m)	Planned Dimension
	10.3 ~ 13.0	1,196,640	6,500	Depth: -12 m Width: 150 m Slope: 1:3	494,515	Depth: -11.5 m
	10.3 ~ 13.0	2,352,220	8,000	Depth: -13 m Width: 150 m Slope: 1:3	1,155,580	*Additional Dredging

Plan	Turning Basin (-12m) (cu.m)	Berth Pocket (-13m) (cu.m)	Sub Total	Inner Channel (-12m) (cu.m)	Outer Channel (-12m) (cu.m)	Sub Total	Total Volume (cu.m)
A-1	431,242	964,330	1,395,572	2,277,747	1,196,640	3,474,397	4,869,959
B-1	1,049,012	677,134	1,726,146	2,195,961	1,196,640	3,392,601	5,118,747
B-2	1,371,349	1,127,607	2,498,956	2,288,524	1,196,640	3,485,164	5,984,120
B-3	1,536,435	535,969	2,072,404	2,131,168	1,196,640	3,327,808	5,400,212
C-1	584,650	276,869	861,519	2,324,847	1,196,640	3,521,487	4,383,006
C-2	584,650	547,620	1,132,270	2,324,847	1,196,640	3,521,487	4,653,757
C-3	584,650	144,650	729,300	2,324,847	1,196,640	3,521,487	4,250,787

Plan	Turning Basin (-13m) (cu.m)	Berth Pocket (-13m) (cu.m)	Sub Total	Inner Channel (-12m) (cu.m)	Outer Channel (-13m) (cu.m)	Sub Total	Total Volume (cu.m)
A-1	338,437	155,000	491,437	0	1,155,580	1,155,580	1,647,017
B-1	322,336	141,250	463,586	0	1,155,580	1,155,580	1,619,166
B-2	400,667	115,250	515,917	0	1,155,580	1,155,580	1,671,497
B-3	269,662	56,500	326,162	0	1,155,580	1,155,580	1,481,742
C-1	307,052	110,250	417,302	0	1,155,580	1,155,580	1,572,882
C-2	307,052	167,750	474,802	0	1,155,580	1,155,580	1,630,382
C-3	307,052	62,500	369,552	0	1,155,580	1,155,580	1,525,132

*Additional

*Additional

*Additional

*Additional

*Additional